TREATISE

ON THE

PRACTICE OF MEDICINE.

BY JOHN EBERLE, M. D.,

PROFESSOR OF MATERIA MEDICA AND BOTANY IN THE OHIO MEDICAL COLLEGE; MEMBER OF THE AMERICAN PHILOSOPHICAL SOCIETY; OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA; AND CORRESPONDING MEMBER OF THE MEDICO-CHIRURGICAL SOCIETY OF BERLIN IN PRUSSIA, &c., &c.

SECOND EDITION.—REVISED AND ENLARGED.

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IN TWO VOLS.—VOL. I.

PHILADELPHIA:

JOHN GRIGG, No. 9, NORTH FOURTH STREET.

LYDIA R. BAILEY, PRINTER.

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No. 25

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Entered according to the Act of Congress, in the year 1831, *by* John Eberle, M. D., *in the Clerk's Office of the District Court of the United States in and for the Eastern District of Pennsylvania.*

TO

GEORGE M'CLELLAN, M. D.,

PROFESSOR OF SURGERY IN THE JEFFERSON MEDICAL COLLEGE,
&c., &c.,

THIS WORK IS INSCRIBED,

AS AN ACKNOWLEDGMENT OF THE HIGH REGARD ENTERTAINED FOR THE
POWERS OF HIS MIND, AND THE GENEROUS SENTIMENTS
OF HIS HEART,

BY HIS OBLIGED FRIEND,

THE AUTHOR.

PREFACE.

In the composition of this work, an effort has been made to exhibit a distinct view of the essential phenomena and principles pertaining to the various subjects which it embraces, with an especial endeavour to avoid the extremes of unsatisfactory brevity on the one hand, and of fatiguing prolixity of detail and discussion on the other. With the exception, therefore, of a few instances in the introductory portion of the work, the author has indulged but little in controversial discussion and general speculation. His object has been, to give a digest of facts and established principles, rather than of opinions and points of disputation. He has not, however, failed to give an exposition of those pathological and therapeutic principles, which appeared to him fairly deducible from the particular phenomena brought under consideration; and wherever his own experience and reflections have led him to differ from others, he has freely, though he trusts with becoming deference, stated his sentiments.

It will be perceived, that no general doctrine or system of pathology is exclusively or especially favoured in the following pages. Medicine, as it is now *generally* cultivated, is strictly *eclectic*. The judicious and unprejudiced physician will neither condemn, nor adopt unreservedly any of the leading doctrines advanced in modern times. He will see something to admire and embrace in the systems of Brown, of Cullen, of Darwin, of Broussais—and

even of the fanciful Hannemann; although when offered to his acceptance as doctrines of universal application, he may very reasonably refuse his assent.

It will be seen also, and perhaps by some regarded as a defect, that no formal classification has been adopted in the arrangement of the work. Nevertheless, the order that has been observed in the succession of the various subjects, is probably as natural as that obtained by any of the modes of systematic arrangement usually pursued in works of this kind. It is now generally, and very justly believed, that the artificial, classific, ordinal, and specific distinctions of NOSOLOGY have an unfavourable influence on the progress of comprehensive and philosophical views in pathology. The primary elements of disease, like those of matter, are probably but few in number. A few *elementary* modes of morbid action (if the expression may be used) modified in their general results or phenomena, by different grades of intensity, modes of combination, and the structures implicated, constitute the fundamental morbid conditions, of which the phenomena by which diseases are described, are merely the external manifestations. It is here that the unfavourable tendency of nosological distinctions mainly exists. Instead of leading the student to contemplate the morbid symptoms as the mere external expressions or signs of disease, modified by various accidental circumstances, and especially by the structures chiefly affected, the artificial divisions of nosology are apt to lead him to regard the groups of symptoms, usually associated, as so many distinct essences, possessing fixed and specific peculiarities of character.

To these objections, the arrangements founded on the particular structure primarily implicated in the disease,

are not liable. It must be admitted, however, that correct and philosophical as such a classification may appear to be in theory, the attempt to reduce it to practice is attended with many very serious difficulties. Nevertheless, should another edition of this treatise be called for, it is the intention of the author to arrange its materials upon this plan of classification.

It is not improbable that various errors may have escaped the author's attention in the course of the work; but he has no apologies to offer for any defects it may be found to possess; and he sends it into the world, in the hope, that with whatever blemishes and deficiencies it may be chargeable, it will be found a useful compilation of facts and principles in pathology and practice.

ADVERTISEMENT TO THE SECOND EDITION.

It will be perceived, that the arrangement promised in the First Edition has been adopted in the present one. That it may be obnoxious to objections in some of its details, cannot be doubted; but the general scheme, it is believed, will be acknowledged to accord better with the present state of pathological science, than the more artificial and complicated classifications repudiated in the Preface.

Considerable additions have been made in the present edition. The subjects of pneumo-thorax, infantile convulsions, pericarditis, and hysteritis, omitted in the former, are introduced in this edition; and the chapter on the general pathology of fever has been entirely re-written. Many pathological and therapeutic observations, also, have been introduced throughout the work; and no inconsiderable number of typographical errors, as well as errors of language, which had escaped the author's attention, have been corrected in the edition now offered to the public.

Philadelphia, September 26th, 1831.

CONTENTS OF VOLUME I.

PRELIMINARY OBSERVATIONS ON THE PATHOLOGY AND ETIOLOGY OF FEVER.

CHAPTER I.

Page.

Of the Pathology of Fever in General, - - - 1

CHAPTER II.

Of the Causes of Fever.

SECT. I. *Of Predisposition, and Predisposing Causes,* - 28
SECT. II. *Of the sources of Morbific Causes, and their General Character,* - - - - - - 31
SECT. III. *Atmospheric Temperature, and its relations with the Animal System,* - - - - 34
SECT. IV. *Of Miasmata,* - - - - - 40
Of the relations of Miasmata to the Animal System, &c. - 50
SECT. V. *Of Contagion,* - - - - - 56

CHAPTER III.

Of the General Course, Type, and Stages of Fever, - 61

I.—GENERAL IRRITATIVE DISEASES OF THE BLOOD-VESSELS INDEPENDENT OF LOCAL INFLAMMATION.

CHAPTER IV.

Of Intermitting Fever, - - - - - - 70

CHAPTER V.

Remitting Fever, - - - - - - 97

CHAPTER VI.

Yellow Fever, - - - - - - - 115

CHAPTER VII.

Continued Fever, - - - - - - 124
SECT. I. *The Synochal Grade of Idiopathic Fever, or Simple Inflammatory Fever,* 128

Page.
Sect. II. *The Synochus Grade of Idiopathic Fever*, 133
Sect. III. *Typhus*, - - - - - - 150

II.—GENERAL IRRITATIVE DISEASES OF THE BLOOD-VESSELS, CONNECTED WITH OR DEPENDENT ON LOCAL INFLAMMATION.

CHAPTER VIII.

Of Inflammation in General, - - - - 172

CHAPTER IX.

Of the Phlegmasiæ of the Alimentary Canal, and its Accessory Organs.

Sect. I. *Of Glossitis*, - - - - - 179
Sect. II. *Of Tonsilitis*, - - - - - 181
Sect. III. *Of Parotitis*, - - - - - 184
Sect. IV. *Of Acute Gastritis*, - - - - 186
Sect. V. *Of Chronic Gastritis*, - - - - 191
Sect. VI. *Of Acute Enteritis*, - - - - 197
1. *Acute Peritoneal Enteritis*, - - *ib.*
2. *Acute Mucous Enteritis*, - - 206
Dysentery, - - - - *ib.*
Sect. VII. *Of Chronic Enteritis*, - - - - 221
Sect. VIII. *Of Acute Peritonitis*, - - - - 226
Sect. IX. *Of Chronic Peritonitis*, - - - - 233
Sect. X. *Of Acute Hepatitis*, - - - - 238
Sect. XI. *Of Chronic Hepatitis*, - - - - 249
Sect. XII. *Of Splenitis*, - - - - - 254

CHAPTER X.

Of the Phlegmasiæ of the Nervous System.

Sect. I. *Phrenitis*, - - - - - - 257
Sect. II. *Arachnitis*, - - - - - 262
Sect. III. *Cerebritis—(Ramollissement du Cerveau.)* - - 276

CHAPTER XI.

Of the Phlegmasiæ of the Respiratory Organs.

Sect. I. *Pneumonia*, - - - - - 279
Pleuritis, - - - - - 280
Peripneumonia, - - - - 282
Pneumonia Biliosa, - - - - 283
Sect. II. *Cynanche Laryngea*, - - - - 296
Sect. III. *Cynanche Trachealis*, - - - 299
Sect. IV. *Acute Bronchitis*, - - - - 313
Sect. V. *Chronic Bronchitis*, - - - - 319
Sect. VI. *Phthisis Pulmonalis*, - - - - 330

Page.

CHAPTER XII.

Of the Phlegmasiæ of the Urinary and Genital Organs.

SECT. I. *Nephritis*, - - - - - - 344
SECT. II. *Cystitis*, - - - - - - 349
SECT. III. *Chronic Cystitis*, - - - - - 352
SECT. IV. *Hysteritis*, - - - - - 355
SECT. V. *Chronic Hysteritis*, - - - - - 360

CHAPTER XIII.

Of the Phlegmasiæ of the Sanguiferous System.

Pericarditis, - - - - 363

CHAPTER XIV.

Of the Phlegmasiæ of the Fibrous and Muscular Structures.

SECT. I. *Acute Rheumatism*, - - - - 368
SECT. II. *Chronic Rheumatism*, - - - - 380
SECT. III. *Gout*, - - - - - - 386

CHAPTER XV.

Of the Inflammatory Affections of the Eyes.

1. *Catarrhal Ophthalmia*, - - - 401
2. *Rheumatic Ophthalmia*, - - 404
3. *Purulent Ophthalmia*, - - - 405
4. *Scrofulous Ophthalmia*, - - 410
5. *Syphilitic and Strumous Iritis*, - 414

CHAPTER XVI.

Of the Cutaneous Phlegmasiæ.—Exanthemata.

SECT. I. *Variola*, - - - - - - 417
SECT. II. *Vaccina*, - - - - - - 432
SECT. III. *Modified Small-Pox*, - - - - 440
1. *Varioloid Affections*, - - - *ib.*
2. *Varicella*, - - - - - 446
SECT. IV. *Rubeola, morbilli*, - - - - 450
SECT. V. *Scarlatina*, - - - - - - 461
SECT. VI. *Erysipelas*, - - - - - 483

CHAPTER XVII.

Minor Exanthemata.

SECT. I. *Herpes*, - - - - - - 497
1. *Herpes Phlyctenodes*, - - - 498
2. *Herpes Zoster*, - - - - 499
3. *Herpes Circinatus*, - - - - 502
4. *Herpes Labialis*, - - - - 503
5. *Herpes Preputialis*, - - - - 504
SECT. II. *Pemphigus*, - - - - - 505
SECT. III. *Urticaria*, - - - - - - 512

Page.
SECT. IV. *Miliaria*, - - - - - - 516
SECT. V. *Lichen*, - - - - - - 519
SECT. VI. *Eczema*, - - - - - - 522
SECT. VII. *Erythema*, - - - - - 527
SECT. VIII. *Roseola*, - - - - - 529
SECT. IX. *Purpura*, - - - - - - 531

CHAPTER XVIII.

Vascular Irritations with a flow of Blood.

Hæmorrhages, - - - - 537
1. *Epistaxis*, - - - - 544
2. *Hæmatemesis* - - - - 547
3. *Hæmaturia*, - - - - 551
4. *Hæmoptysis*, - - - - 554
5. *Menorrhagia*, - - - - 560

CHAPTER XIX.

Phlegmasiæ of the Lymphatic System.

Phlegmasia Dolens, - - - 566

A

TREATISE

ON THE

PRACTICE OF MEDICINE.

A. PRELIMINARY OBSERVATIONS ON THE PATHOLOGY AND ETIOLOGY OF FEVER.

CHAPTER I.

OF THE PATHOLOGY OF FEVER IN GENERAL.

The history of practical medicine consists of little else than a review of the doctrines which have successively risen and sunk again, concerning the nature and treatment of fever. Whatever other objects of interest or importance within the dominion of medical science may have attracted the attention of physicians, fever has at all times been viewed as presenting the most extensive and inviting field for observation and the exercise of ingenuity. It is in this department that observation and research have been most industrious in accumulating materials, and that hypothesis has luxuriated in her wildest exuberance.

When, indeed, it is considered that the destroying angel has made his most desolating visitations under the form of febrile epidemics, and that in the long list of human maladies, *fever* occurs in perhaps nine cases out of ten, the paramount importance of this subject is strongly forced upon our convictions.*

* "If we except," "says Van Swieten, "those who perish by a violent death, and such as are extinguished by mere old age, and which are indeed few, almost all the rest die either of fever, or of diseases accompanied with fever. We read in Pliny with what fear and trembling the Romans endeavoured to have this universal disease—*fever*, appeased by their supplications in the temple of Fanum; and hence, perhaps it is, that fevers are called *diseases* by Hesiod, and that Horace calls all diseases simply fevers, when they rushed out of the box of Pandora—

'Post ignem ætherea domo
Subductum, Macies, et nova febrium
Terris incubuit cohors.'"

Van Swieten's Com. vol. v. p. 1.

From a retrospective glance over the history of our science, we are forced to acknowledge that there is, perhaps, no subject which is more eminently calculated to humble the pride of human reason than this one. In relation to this subject, pathology has been in a continued state of revolution and instability. The human mind has been engaged with it for near three thousand years. Theories have risen and sunk again in a continued and rapid series of succession; each has had its hour "to strut upon the stage," and its votaries to yield it faith; but the stream of time has hitherto overturned all these insubstantial, though often highly wrought fabrics.

Has the mind then made no real advancement in relation to the pathology of fever? Are we now no nearer correct and rational views concerning this important subject, than were our forefathers? Has genius always wandered in idle quest, and brought back no substantial trophies from the regions of pathological speculation on this point? Far from it. Like the assymptotes of the parabola, the human mind is continually verging towards truth, although it may never reach it in relation to the essential nature of fever. There has probably never been a theory or doctrine promulgated on this subject, which did not clear away some old rubbish, or bring to fuller view some of the relations of the phenomena it presumed to elucidate. The dreams of speculation have vanished; but the facts and correct principles which were necessarily mingled with them, remain as so much valuable treasure saved out of the wrecks of former systems. The mass of solid materials which has been thus gradually accumulated, has now in a great measure displaced those vague and hypothetical foundations upon which former doctrines in relation to this subject were constructed. Hypothesis is no longer tolerated in science. Philosophy does not acknowledge her as a legitimate servant. The cyclus of her empire has gone by; and the genius of rational induction is now the only power under whose direction the votary of science presses forward to conquest in the fields of knowledge.

Like many other things which are at once obvious to the senses, and concerning the existence of which almost every one can decide, *fever* does not admit of a strictly correct and unobjectionable definition; since there is not a single symptom which is invariably present, and which can be regarded as absolutely essential to its existence.

Boerhaave collected together, from a great number of authors, all the symptoms which had been observed in fevers. He then struck from this list, all those symptoms which do not appear in all, but only in certain modifications of fever—retaining such only as by the common consent of authors and his own observations, were found to be present in every instance of fever. The result

was, that only three symptoms were left standing—namely, a quick and frequent pulse—preternatural heat of the surface of the body, and a sense of cold or chilliness in the commencement. But he might have gone farther, and struck from his list these symptoms also; for it is quite certain that cases of fever do occur in which there is neither preternatural quickness and frequency of the pulse, nor an increased temperature of the surface of the body; nor is a sense of chilliness, though perhaps the most constant of all the febrile symptoms, universally present in the initial stage of fever.

Notwithstanding the great difficulty, or rather impossibility, of giving a strictly unexceptionable scientific definition of *fever*, yet the train of phenomena which this state of disease presents under all its modifications—varying more or less in their concomitance and succession—offers, upon the whole, a character sufficiently distinct and definite for easy and certain recognition.

Pathologists have divided fevers—according to the mode of their development—into *idiopathic* and *symptomatic*, and the propriety or impropriety of this division constitutes, at the present day, one of the most important, and warmly contested subjects in pathology. By the former class, are understood those fevers that are developed and sustained by causes, which produce a general morbid state of the system, independent of local inflammation or fixed irritation. Those who admit the existence of such fevers, suppose that the remote febric cause produces a deleterious impression on the sentient extremities of the part upon which it acts, which deranging function after function, according to the catenation of the organic sympathies, finally results in a state of general disease, characterized by the ordinary phenomena of fever; or, as they presume, the remote cause may gradually change the healthy character of the circulating blood, which, acting as a morbific irritant on the heart and arteries, gives rise to febrile reaction.

Many eminent pathologists, on the contrary, contend that such fevers can have no existence; and that all febrile excitement is purely symptomatic, and of course essentially and wholly dependent on a pre-established local irritation or inflammation. According to these views, the direct influence of the remote causes of fever is limited to the production of the primary local inflammation or irritation, the subsequent pyrexial phenomena being the result solely of this primary local affection; in other words, the secondary and sympathetic excitement of the pre-established focus of irritation. At the head of those who advocate the exclusive symptomatic nature of fever is Broussais, who, whatever may be thought of his peculiar doctrines in relation to this subject, has manifested a professional zeal, and an activity and acuteness of intellect, which have justly placed him high among the

"greater lights" of our profession. Not satisfied, however, with the adoption and defence of the general doctrine of the universality of *symptomatic* fever, Broussais contends that the inflammation or irritation whence the febrile sympathies radiate as from a focus, is almost universally located in the mucous membrane of the alimentary canal; and hence *gastro-enteritis* is with him the *fons et origo* of febrile phenomena.

That fever is a very common result of local inflammation, is unquestionable. So intimate are the sympathetic relations between all the various parts of the animal body, that no structure or organ can be strongly irritated without causing a sympathetic irritation in other organs or structures. If the primary irritation involve the sanguiferous capillaries, the irritation will be communicated by sympathy to the general vascular system, and fever will be the result; but if the local irritation be purely nervous, it will be diffused, and as it were locked up in the general nervous system, and give rise to convulsions, or some other form of general nervous affection. Without doubt too, inflammation of the mucous membrane of the alimentary canal is much more common in febrile diseases than was formerly, and by many is still supposed. It is even probable that in many instances of fever, such an inflammation constitutes the *primary* and essential cause of the febrile phenomena. This is, perhaps, most apt to be the case in those instances of fever which result from the combined agencies of impure and indigestible diet and atmospheric vicissitudes. But although we may admit the correctness of these observations, yet to refer all fevers, remitting, intermitting, and continued, to *gastro-enteritis*, is as remote from truth as it is detrimental in its influence on practice.

The advocates of the *physiological* doctrine, as it is called, endeavour to support their sentiments in relation to this subject, by the phenomena detected on post-mortem examination, and by arguments founded on physiological principles. It is affirmed that marks of inflammation almost universally occur in the mucous membrane of the alimentary canal, in subjects that die of febrile affections. The capillary vessels, to a greater or less extent, of this membrane, it is said, are found injected; and in many instances other and less equivocal traces of previous inflammation are discovered. Admitting that such manifestations of inflammation are as universal as they are asserted to be, is there not much reason to believe that, very frequently at least, the inflammation *supervened* during the course of the disease, as a *consequence* of the fever, rather than that the inflammation was pre-established, and became the immediate exciting cause of the febrile phenomena? We frequently see inflammations supervene in parts exposed to observation many days after general fever has been fully established. Indeed, when it is considered that in all febrile

affections, the secretions which are poured into the intestinal tube, are unnatural and vitiated—that the process of digestion is suspended, or much impaired, and consequently, that fermentation and decomposition of the contents of the stomach and bowels are especially favoured—is there any cause to wonder that we should so often meet with traces of inflammation in the digestive organs in those who die of febrile affections? The Broussaian mode of treating fevers, although especially meant to obviate such inflammations, appears to me, in one respect, well calculated to favour their occurrence. The almost total proscription of purgatives from the list of our remediate means for the treatment of fever, so far from lessening the tendency to gastro-enteritis, tends, I conceive, in general, to an opposite result. In a recent work by Bouillaud, there are upwards of sixty cases of fever reported, in not a single instance of which was there a purgative medicine administered by the mouth. In all of these cases however marks of inflammation, and in the majority ulcerations were detected in some portion of the mucous membrane of the bowels. That this should have been observed, will not appear strange, when it is considered that in all the cases, most of which continued from three to four weeks, all the acrid and vitiated contents of the intestines were suffered to remain, undisturbed, to act on their delicate lining membrane.

To one not thoroughly imbued with Broussaism, it does appear strange that any one should withhold a laxative, under the apprehension of its causing injurious irritation, and yet suffer, without any such fears, the most irritating substances to lie quietly in the bowels. It is true, laxative *lavements* were repeatedly resorted to in these cases, but that these did not disturb or remove the acrid materials which were enclosed in the bowels, is abundantly manifest from what Mr. Bouillaud himself has stated. After having gravely told us that in all the cases he describes, the traces of mucous inflammation in the bowels were *très prononcé*, he states that, "in general the stomach and small intestines were *filled with a yellowish or greenish bile, and that the residue of the alimentary substances which were found in the small and large intestines, invariably exhaled an intolerably fetid smell, and frequently exhibited the consistence of mustard. This residue, mixed with various fluids secreted in the intestines, appeared to have undergone a complete process of putrefactive decomposition, as was evident from the extreme offensiveness of the smell, and the fetid gas which distended the bowels.*"*

Can it be reasonably supposed that the transient and moderate irritation of a purgative in these cases would have been more injurious than the constant impressions of the acrid and irritating

* Traité Clinique et Experimental des Fièvres. Par J. Bouillaud, Paris, 1826.

substances which were so long left in immediate contact with the bowels? It is thus, it can hardly be doubted, that many instances of gastro-enteritis, so abundant in the practice and dissections of the Broussaian school, are developed. Were laxatives employed with due moderation, it is probable, that the so much dreaded *gastro-enterite* would in some instances at least, perhaps in many, be prevented, and the world deprived of a large proportion of those triumphant demonstrations which are continually brought out in formidable array in support of the *physiological doctrine*.

As a further offset to the evidence adduced from post mortem examination, it must be observed, that so far as the mere redness or injected state of the mucous membrane is concerned, we can draw no certain inference as to the previous existence of inflammation in this structure. That these phenomena are frequently the result of changes affected in *articulo mortis*, or *post mortem*, is fully demonstrated by the observations of Mr. Yellowly and of Mr. Seeds.*

* "It must have happened to every one," says the former of these writers, "accustomed to the examination of dead bodies, to see appearances of vascular injection in the villous coat of the stomach. Such appearances have very frequently been referred to inflammation, but they have probably been but little studied. I have several times been present at the examination of bodies, where the vascularity of the villous coat of the stomach was so considerable as even to give rise to suspicions that the appearance had been produced by something deleterious. I was therefore induced to embrace frequent opportunities of viewing the state of the inner surface of the stomach, and I so often found in it the appearances alluded to, as to induce me to imagine, that the opinion which is commonly entertained of their being marks of disease, is not well founded. In persons suddenly destroyed, when apparently in perfect health, he found the mucous membrane of the stomach highly injected." Mr. Seeds too, found that in animals bled to death, the membraneous structures frequently exhibit a state of injection which might, at first sight, be readily mistaken for inflammation.

It is well known that the arterial tubes possess a power of contracting to a considerable extent, by what Bichat calls the contractility of texture, and that this power is not limited to the period of life, but continues some time after death. It is equally ascertained that the capillaries are endowed during life with a peculiar degree of sensibility which causes them to resist the entrance of such fluids as they are not destined to convey in the performance of their natural functions. This peculiar sensibility, by virtue of which, the serous capillaries refuse, or contract against the intromission of red blood, would seem to depend on the regular influx of the nervous influence. That this is the case, appears highly probable, if not certain, from the different results arising from the forcible injection of fluids into the arteries in living and dead animals. "Push into the aorta of a living animal, by means of a syringe, different fine fluids, and you will never see them fill the capillary system, or issue by the exhalents;" when, however, the same experiment is performed on an animal soon after death, the fluid will be found to pass readily into the serous capillaries, and pass out by the exhalents, excretory ducts, &c. (*Bichat.*) Mr. Buniva's experiments, quoted by Bichat, with injections upon dead and living animals illustrate this fact in a very striking manner. He fixed the pipe of a syringe into an artery of a living animal; on endeavouring to force the fluid into the vessel he found very great resistance, the piston passing down very slowly, and only with the application of much force. On causing the animal to be suddenly killed, by dividing the

Broussais and his followers are indeed fully sensible of the observation of Celsus: *Neque quicquam esse stultius quam quale quid vivo homine est, tale existimare esse moriente imo jam mortuo;* for where they fail in detecting a red and injected state of the mucous membrane of the bowels, they account for its absence by ascribing it to a *post mortem* change; thus availing themselves of this fact when it affords an argument in their favour; whilst they manifest an unwillingness to allow any importance to it when it is adduced against their doctrine.

It cannot indeed be presumed that the injected state of the mucous membrane of the intestinal tube, so often discovered in those who die from fevers, is always, or even generally, to be ascribed to a mere post mortem change; but that such changes do sometimes, nay often occur, and that they have been assumed as evidences of previous inflammation, there can exist but little doubt.

The first obvious effect of the remote febrific causes, consists almost universally in a diminution of the nervous energy, and consequently of the action of the heart and arteries. This is manifested by the weak and contracted pulse, the general langour and lassitude, the diminished temperature and the sense of chilliness which usher in all febrile affections. These initial phenomena of fever are especially conspicuous in intermittents, remittents, and in catarrhal affections. There is nothing in the character of these symptoms which can justify the inference that they are dependent on inflammation. "Inflammation," says Dr. Armstrong, "cannot exist in the cold stage of fevers, all the phenomena of which are directly opposed to inflammation." The course and phenomena of intermitting fevers present us indeed with insurmountable objections to the "*physiological doctrine.*" The periodicity of these fevers is strongly opposed to the idea of their immediate dependence on gastro-enteritis. It is, indeed, true, that affections of an inflammatory character, have been known to recur in a strictly periodical manner; but such cases must be

spinal marrow just below the occiput, the fluid passed rapidly out of the syringe into the artery, although but little force was applied. While the capillaries retained their full portion of vitality, they resisted the introduction of the fluid; but as soon as they had lost their sensibility, in the death of the animal, they yielded like passive tubes to the fluid forced upon them by the *vis à tergo.* The application of these facts to the *post mortem* production of a red and injected state of the membraneous structures, especially the more vascular ones, is easily to be understood. So long as the serous capillaries retain their vitality, they resist the entrance of red blood into them. As soon, however, as their vital properties cease to exist, they lose the power of resisting the intromission of red blood—becoming, in fact, mere passive and yielding tubes. But as the arteries continue to contract on their contents, some hours after the extinction of life, they must necessarily force the blood forward into the relaxed and unresisting capillary system, into which it will therefore be driven, as into a sponge, and give to the more vascular structures, the red and injected state, so often found on post mortem examination, where no previous inflammation whatever existed.

viewed as anomalies, and altogether contrary to the almost universal course and character of phlegmasial diseases. An inflammation which observes a perfect periodicity in its attacks, must be *sui generis*. If intermitting fever depend on inflammation of the mucous membrane of the alimentary canal, then must this inflammation be periodical, and therefore essentially distinct from the inflammation which produces *remitting* fever; for in this malady it must be continuous. These two forms of fever are however produced by the same remote cause; and we are therefore forced to admit, by the assumption of this doctrine, that the same remote cause is capable of producing two kinds of inflammation essentially distinct from each other. The character of the remedies too which have been found most effectual in arresting intermitting fever, is directly opposed to the idea that *gastro-enteritis* constitutes its proximate cause. Who can believe that quinine, arsenic, black pepper, and other remedies of a similar character are peculiarly calculated to cure inflammation of the mucous membrane of the alimentary canal? Indeed these very articles appear to be particularly dreaded by the disciples of this doctrine, on account of their tendency to create gastro-enteric irritation, and yet all experience goes to prove that they are decidedly the most prompt and valuable means for the cure of intermitting fever.

M. Broussais' theory of the mode in which the remote causes of febrile affections produce gastro-enteritis is gratuitous, and but little calculated to satisfy the understanding. "Every irritation," he says, "which is capable of producing a perception in the brain, passes back by the nerves *to be repeated in the mucous membranes*." Thus, if a person be inoculated with small-pox virus, the irritation of the primary pustule, or of the inoculated point, is conveyed to the brain, whence it is reflected by the nerves upon the mucous membranes of the alimentary canal, where it establishes an inflammation. This intestinal inflammation constitutes the essential cause of eruptive fever, and the eruption itself is only a metatastic disorder of the cutaneous system. The assumption then, "that every irritation which is capable of producing a perception in the brain, is reflected by this organ to be *repeated in the mucous membranes* of the alimentary canal, forms the main principle in the Broussaian doctrine of the etiology of fever. That the mucous membranes of the intestinal tube possess a very wide sphere of sympathetic relations, is a fact indeed as undeniable as it is important in a patholigical point of view. But that this structure constitutes a subordinate sensorium commune, to which all morbific impressions are especially conveyed, after having been perceived by the brain, is a position which all the zeal and ingenuity of its advocates have as yet failed, and I apprehend will ever fail to place

upon that firm basis, which it ought to have to serve as a foundation of our pathological faith.

I do not mean to object to the general fact, that all impressions capable of ultimately exciting fever, are in the first place communicated to the sensorium commune, and thence reflected throughout the system, and sometimes upon some particular organ or structure; but this reflected impression does not, it may be justly maintained, necessarily establish a focus of irritation, nor always, or even generally, fall especially upon the intestinal mucous membrane.

If the impressions of morbific causes are always transferred to the mucous membrane of the alimentary canal, the impressions of all agents, remedial as well as others, must of course be referred to the same structure. This, however, does not accord with the results of observation. When mercury is rubbed on the skin, the salivary glands, the gums, and the mucous membrane of the mouth, receive the chief impressions excited by this agent. Will it be contended that a gastro-enteritis must be established before salivation can be produced? If opium be applied to any part of the body, the impressions are concentrated in the nervous centre. When cantharides are applied to the surface, the irritation is conveyed to the neck of the bladder, and not to the mucous membrane of the bowels, and yet fever may be the result. From these and many other similar facts that might be adduced, it is manifest that the supposed law of the animal economy, by which, as is alleged, all febrific impressions are reflected from the brain and *repeated* in the mucous membranes of the bowels, is gratuitous, or to say the least, highly improbable.

The fallacy of those doctrines which confine the primary inflammation to some one structure exclusively, is strikingly illustrated by the circumstance, that different writers have fixed on *different* structures, as the parts primarily affected in fevers. Thus Clutterbuck maintains, with Broussais, that fever is always a purely symptomatic affection depending on local inflammation pre-established by the febrific cause. He asserts that this primary inflammation is invariably located in the brain and its membranes, and adduces the phenomena discovered on post mortem examination, in testimony of the correctness of his doctrine. Broussais, on the other hand, asserts that the primary inflammation is not in the brain, but in the mucous membrane of the bowels, and appeals with equal confidence to the appearances exhibited on dissection for confirmation of *his* doctrine.

This discrepancy is in itself sufficient to show the weak foundation on which these two doctrines rest; for if the evidence afforded by autopsic inspection in relation to this subject were not extremely ambiguous, it would, one may suppose, be impos-

sible to draw from it conclusions so very discrepant, and yet so nearly equal in point of plausibility.

The advocates of the gastro-enteritic pathology of fever, place no inconsiderable reliance for support to their doctrine on, what they are pleased to assert, their superior success in the remediate management of fevers. Leeches, and an almost total abstinence from food, with cooling, acidulated, mucilaginous drinks, constitute nearly the whole of their remediate applications; and they claim for this mode of treatment, a greater success than that which they allow to others who pursue a more active course of treatment in fevers. It does not appear, however, that the golden age of medical success, so confidently promised by Broussais, on the introduction of his doctrine, has as yet arrived;* for the statements which have been published in France, in reference to the comparative mortality under the Broussaian, and the other modes of treatment, give no support to the claims of superior success set up for the former. We might however admit the excellence of the Broussaian mode of treating fevers, without yielding our assent to the correctness of the doctrine that the gastro-enteritis is primary where it *does* exist. There exists but little doubt in my mind, that in continued and remitting fevers, active purgation is not unfrequently carried to an injurious extent; for although we may, and, as I conceive, ought, to reject the opinion that such fevers *depend* essentially on gastro-enteritis, yet we cannot doubt, that a very considerable degree of irritation, amounting in many instances to inflammation, does often *supervene* during the progress of the disease, as an *epiphenomenon*, and unconnected with the origination of the fever. In cases where such a condition of the mucous membrane of the intestinal canal occurs, during the course of the disease, the soothing treatment recommended by Broussais, is no doubt more salutary than the vigorous purgative plan so commonly pursued in this country and in England. Unquestionably, intestinal irritation and inflammation perform an important part in febrile diseases. These conditions may arise as consequences of the general febrile reaction, as well as from harsh and repeated purgation, and the use of other irritating remediate agents. But it is equally probable that *gastro-enteritis* is often excited by acrid and vitiated secretions, and other offensive materials retained in the

* In 1821, Broussais asserted "that the tables of mortality declare in favour of the *new doctrine*, and that *its influence upon population would be more favourable than that of the introduction of vaccination.*" Unfortunately, however, this happy influence of the *nouvelle doctrine*, remains yet to be realized;* and the advocates of the doctrine may console themselves for the tardiness of this influence, with the certain propect of not being very soon deprived of the opportunity of publishing their ordinary quantum of *post mortem* examinations.

* Refutation de la Doctrine de M. L. Doct. Broussais, Par. L. Castel.

bowels in consequence of withholding suitable laxatives, in the commencement and during the progress of the malady. Broussais has done much good, by awakening the attention of the profession to these pathological conditions; and thus furnishes another proof of the fact, that new doctrines, though fundamentally erroneous, seldom fail to do some good, by directing the views of physicians to important circumstances, which were previously overlooked, or too much neglected.

In leaving this subject, I deem it right to observe, that however widely we may differ from Broussais in relation to the pathology of fever, all must admit that he has just and high claims to the respect and gratitude of the profession for the light which he has thrown on the nature, symptoms, and treatment of mucous intestinal inflammation, as well as on the physiological and morbid sympathies of the animal system.

Broussais is unquestionably one of the most enlightened and ingenious pathologists of the present day. His is now the only general doctrine which especially occupies the attention of the profession. Like all the preceding great doctrines in medicine, it is destined, perhaps, to culminate for a while in the firmament of our science, and to attract its host of worshippers; but, assuredly, sooner or later it must sink again, and add another to the long list of once highly favoured, but now exploded and neglected doctrines. That the Broussaian system contains much that is valuable, it would be unjust to deny; but to these concessions in its favour, there are, unless the majority of competent judges greatly err, offsets of no small moment. In relation to this doctrine, as indeed of every one else, it behoves us to embrace the useful and reject the false; in short, to adopt the good advice of Lucretius,

> "———————— doctrinam acri
> Judicio perpende; et si tibi vera videtur
> Dede manus—aut si falsa est, accingere contra."

Having now given a summary of the principle objections which may be urged, successfully, I conceive, against the "new physiological doctrine," I proceed to an exposition of the following propositions, as embracing the leading, and it is believed, tenable points of doctrine, in relation to the mode of origin and character of febrile diseases.

1. Fever is a general disease—the sanguiferous system being essentially and predominantly disordered.

2. The morbid vascular excitement of fever is located, essentially, in the capillary system of blood-vessels,—consisting in *irritation*, and not in mere *increased* or *decreased* action.

3. This irritated excitement may be the result of morbific causes acting directly on the internal surface of the sanguiferous system; or, of irritating impressions conveyed sympathetically to this system, from a primary focus of irritation.

4. The first link, in the chain of morbid actions, which occur in the development of fever always commences in the nerves.

5. The general remote or exciting causes of fever rarely produce local inflammation, anterior to the development of the general febrile reaction. Their action is confined to the production of morbid impressions on the nerves, which passing inwards to the brain, usually cause a temporary depression of its energies, and consequent disturbance in the equilibrium of the nervous and vascular excitements; at the same time that the morbid impressions reflected by the brain throughout the system, contribute to the functional disturbance and irritation of certain internal organs or structures.

6. Although local inflammation is not essential to the production and support of fever, yet, in many instances of idiopathic or general fever, more or less inflammation supervenes, after the febrile reaction is established; and occasionally the development of the febrile excitement and local inflammation is effected simultaneously.

7. Inequilibrium of excitement, and local determinations of blood, constitute an important characteristic of fever; for although strictly a general malady, there are always some organs or structures in a state of increased morbid excitement, whilst at the same time, others are in an enfeebled, languid, or torpid condition.

In stating that fever is a general malady, it is not presumed that every structure of the organization is in a state of actual disease; but as the nervous and vascular systems are so intimately concerned both in the composition and functions of every part of the body, it may well be inferred, that where these two systems are in a morbid condition, as they manifestly are in fever, every other irritable and sensible structure must suffer more or less functional derangement. Nevertheless, it cannot be questioned that the essential morbid excitement, which constitutes fever, is located in the sanguiferous system. The disordered action of the heart and arteries—the increased temperature of the body—the altered state of the secretions, the morbid appearances on dissection—and, in most instances, the changed state of the blood, afford sufficient evidence of the paramount disorder of the blood-vessels in febrile affections.

The morbid vascular action of fever is an irritated and not a mere increased action of the heart, arteries, and capillaries. There exists a wide difference between *irritation* and mere *excitation*. The former is the result of stimuli acting either

directly or indirectly upon an organ or structure, whose vital properties are in a deranged or morbid condition; and is therefore always essentially connected with a disordered state of the nerves of the part affected. This result is not simply a greater or less degree of the natural or healthy excitement, but an action or excitement essentially morbid or distinct from healthy action. Mere excitation, or increased action, on the other hand, is the result of stimuli acting on an organ or system whose vital properties remain in a healthy or underanged condition. A few ounces of alcohol, for instance, will cause a high degree of arterial action in an individual not accustomed to this stimulus; and the same effect will be produced by any sudden and violent bodily exertion, as running, rapid walking, &c. Here then, there is *increased* action of the heart and arteries, with an augmented state of the animal temperature; but this does not constitute fever. The vital properties remain in their normal condition, and the organs thus inordinately excited, return to their natural and healthy grade of action, as soon as the exciting cause ceases to act. As, however, all excessive action tends to weaken, and finally to derange the vital properties of the over-excited parts, so, when such stimuli are very protracted in their influence, they may, at last, disorder these properties and give rise to fever. Without such a derangement or morbid condition of the sensibility and irritability of the heart, arteries, and capillaries, no fever can occur; for so long as the vital properties retain their natural state, all irritants or stimuli, can produce only a greater or less degree of normal excitement, and the secretions will be diminished or increased, but not depraved. As soon, however, as these properties have departed from their healthy condition, every stimulus, whether natural or morbific, must necessarily excite morbid actions. Hence, it may be concluded that every cause which produces fever, in whatever way its influence may be conveyed to the sanguiferous system, must necessarily derange its vital properties, either directly or indirectly, before that general irritated vascular action which constitutes fever, can be established.

It is evident, therefore, that although the characteristic phenomena of fever depend on morbid action of the heart, arteries, and capillary vessels, the nerves also are essentially and primarily disordered in febrile diseases; for irritation, as has just been observed, necessarily implies a morbid or deranged condition of the vital properties, and it cannot be doubted that, so far, at least, as the capillary system is concerned, these properties are derived immediately from the nerves.

From a careful analysis of the phenomena of fever, it would appear that, although the sanguiferous system generally, is prominently disordered in fever, yet the essential febrile excite-

ment is especially located in the capillary system of blood-vessels. Fever cannot exist without capillary irritation or derangement of the secretory and excretory functions. So long as the capillary functions remain free from morbid excitement, or the principal secretions continue to be performed in a healthy manner, no increased action of the heart and arteries can constitute fever, but only an over-excited state of these organs, which will subside when the exciting cause is removed. A person who is thrown into a violent gust of passion, experiences vehement action of the heart and arteries; but unless the capillary vessels are brought into a state of morbid excitement, or irritation, it will not be fever, but simple super-excitation.* On the other hand, *manifest* disorder in the action of the heart and arteries, does not appear to be essential to the existence of fever. Fevers of the most malignant and fatal character—attended with unequivocal manifestations of capillary disorder, such as hæmorrhage, petechiæ, and inflammation not unfrequently occur, in which no obvious deviation from the natural action of the heart and arteries can be detected. Dr. Smith, in his very valuable treatise on fever, observes, that the order in which the morbid actions which constitute fever, occur, "is, first, derangement in the nervous and sensorial functions; this is the invariable antecedent: secondly, derangement in the circulating function; this is the invariable sequent: and thirdly, derangement in the secreting and excreting functions; this is the last result in the succession of morbid changes. Derangement in the functions of secretion and excretion never comes first in the series: derangement in the nervous and sensorial functions never comes last in the series: derangement in the function of the circulation never comes either first or last in the series, but always the second in succession."

That derangement of the nervous system constitutes the initial link in the chain of morbid actions which occur in the development of fever, cannot be doubted. The mental and muscular languor—the general *mal aise* and uncomfortable sensations—the pains in the loins and extremities—the morbid sensibility to low temperature—the dejection and irritableness of temper, and the confusion and weakness of the intellectual powers, which so universally usher in febrile diseases, afford unequivocal evidence of pervading derangement of the nervous system.

In relation to the subsequent order of the morbid changes which supervene in the development of fever, however, we cannot adopt the sentiments expressed by Dr. Smith. The assertion,

* Some of the sentiments stated in this chapter, do not differ materially from those given by Dr. Southwood Smith, in his interesting work on fever. The views here given, whether correct or incorrect, I have taught in my public lectures for seven years past.

that the heart and arteries are universally, and necessarily deranged, next in order to the primary disorder of the nervous system, and before the capillary or secretory extremities of the blood-vessels are brought into a state of morbid excitement, appears, I think, contrary both to correct physiological principles, and to the results of observation. It is well known that the extreme vessels—the secreting capillaries are incomparably more closely connected with, and dependent for their functions on, the nervous system, than the heart and larger blood-vessels. It is scarcely necessary to refer to the experiments of Wilson Philip and other modern physiologists in support of this observation. From this physiological principle alone, then, we would be led to infer, that the extreme vessels—those which are immediately, or at least very intimately, concerned in the process of secretion and calorification, would be the first to suffer derangement of function from general morbid excitement of the nervous system. That capillary derangement is, in fact, the immediate sequent of the primary functional disturbance of the nervous system in the evolution of fever, appears to me sufficiently demonstrated by the phenomena presented in the forming stage of the disease. Who does not know that torpor of the cutaneous exhalents is one of the most common initial symptoms of fever? This function is frequently prominently deranged, before any manifestations of the morbid action of the heart and arteries can be detected. When koino-miasmata acts slowly upon the system, we often find, along with the above-named symptoms indicative of disordered nervous excitement, decided evidence of functional derangement of the liver, as well as of the perspiratory vessels. The utter groundlessness of Dr. Smith's sentiments on this point, may indeed be predicated on the simple circumstance, that it has led him, necessarily, to deny, that pneumonia, hepatites—in short, all the affections embraced under the general term *phlegmasia*, are fevers! Believing, as he does, that the order of morbid changes, from the nerves to the secretory capillaries, and finally, to the heart and arteries, is universal, and as invariable as the laws of nature, he is, of course, obliged to deny the name of *fever*, to the general sympathetic phenomena which occur in consequence of local inflammation—for in these *symptomatic* fevers the successive morbid changes occur, he says, in a different order. "Febrile diseases," he observes, "are commonly divided into idiopathic and symptomatic—a division which is liable to the fundamental objection, that the diseases included under the second head *are not fevers*, but inflammations. *There are no fevers but idiopathic fevers.*" And the reason why the general symptoms of the phlegmasia do not constitute fever is, he says, because, "in pneumonia in enteritis, in hepatites, &c. the spinal cord and the brain are *never* the organs in which the *first*

indications of disease appear; the earliest indications of disease that can be discovered, having their seat in the affected organ itself, and it being only after the disease has made some progress, that the other organs (the heart and arteries, and the brain) and functions are involved." Ingeniously as Dr. Smith has argued upon this subject, very few, it may be presumed, will agree with him in denying, that the general morbid actions arising from local inflammation, are truly and essentially febrile. In truth, however, the alleged diversity in the order of the morbid changes of idiopathic and symptomatic fevers, has no existence. Local inflammation, like every other exciting cause of fever, that does not act directly on the heart and arteries, can affect the general system only through the medium of the nerves; and hence, we almost invariably find the same train of symptoms accompanying the rise of fever from inflammation, as is known to usher in idiopathic fever. What do we observe when fever comes on from a wound? The patient, at first, experiences some degree of febrile languor—accompanied with a sense of slight chilliness, *mal aise;* and derangement of the exhalent functions of the skin. These symptoms, though often so slight and transient as to be scarcely perceptible, invariably precede the occurrence of the febrile reaction of the heart and arteries; and hence the order of sequence in the morbid actions, which take place in the development of symptomatic fever, does not differ from that which obtains in idiopathic fever. The nerves always receive the first shock and morbid change. This speedily gives rise to more or less conspicuously deranged action of the secretory capillaries—and finally, the heart and arteries are morbidly excited.

While Dr. Smith more confidently than prudently, asserts, that "there can be no fever but idiopathic fevers," Broussais and his disciples assert, that "the existence of idiopathic fever is impossible." Such are the contradictory extremes to which theory is apt to lead the understanding! That fever may occur both with and without local inflammation, may be disputed by theorists, but cannot be doubted by those who observe diseases with unbiassed judgments, in the light of common sense.

It must indeed be admitted, that *local* irritation or *local* morbid action, invariably occurs, as the initial morbid condition, whence the series of consecutive deranged actions in the evolution of fever have their origin. This admission does not imply a concession in favour of the Broussaian doctrine, since it is predicated, in part, on the demonstrable position that the local morbid excitement is not unfrequently located in a greater or less extent of the lining membrane of the blood-vessels themselves, and produced by irritating agents admitted into the circulation from without, or by retained recrementitious elements

acting directly on the internal surface of the sanguiferous system.* It appears to me that there is no pathological fact which is more susceptible of satisfactory illustration, than that fever frequently arises from morbific causes acting immediately on the sanguiferous system, and establishing a primary irritation in a greater or less extent of its internal lining membrane.

Without denying the all-pervading influence of that principle of the living system, called sympathy—or still more comprehensively, without denying that all the phenomena of life, whether of health or disease, are but so many manifestations of the *action of the living solids*, it is a truth equally undeniable, that the blood may and does frequently serve as the medium through which deleterious agents act immediately on the heart and arteries, and thus give rise to febrile phenomena. "The veinous system," says Bichat, "may be regarded as a general reservoir into which are poured all the materials which are to be thrown out of the body, and all those which are to enter it. In this last respect, this system of vessels performs an essential part in the production and support of diseases. The deleterious substances may be introduced into the blood-vessels with the chyle, and produce ravages in the system in circulating with the fluids. There can be no doubt, moreover, that, besides the principles which convert the veinous into arterial blood, there often passes through the lungs into the circulation, deleterious miasmata, which produce diseases, as my experiments on asphyxia have proved. The intestines, the lungs, and the skin, are the three avenues through which the morbific agents may gain admission into the circulation."†

That foreign substances are readily taken up by the absorbents and veins, and conveyed into the circulation in an unassimilated state, is now no longer a subject of doubt or dispute. It appears to me highly probable, that *miasmatic* agents act upon the animal system, in part at least, by being admitted through the lungs, into the current of the circulation. Some contend that these aerial morbific causes act primarily on the stomach. It is asserted, that the miasm, becoming entangled in the saliva, and swallowed with this fluid into the stomach, establishes a primary morbid impression in its delicate mucous membrane. It is alleged, in confirmation of this opinion, that the stomach, possessing a very extensive circle of sympathetic relations, and being highly sensitive to impressions, is peculiarly calculated to become the primary focus of morbid excitement from external morbific causes. It is affirmed, moreover, that the initial symp-

* M. Bouillaud, whose work I have already mentioned, advocates this view of the etiology of certain varieties of fever.

† Anatom. Gener. vol. I. p. 284.

toms of fever point out the primary influence of the febrific cause on the stomach. The depressed or abolished appetite, the nausea and vomiting, and the peculiar sense of uneasiness in the epigastrium, are considered as affording strong evidence of the correctness of this opinion. It is asserted, finally, that the lungs are endowed with an inferior degree of sensibility, and that their sympathetic relations are by no means very extensive, and that, therefore, they are but imperfectly adapted for receiving and propagating morbid impressions from external causes.

In reply to these arguments, it must be observed, that it does not seem probable that a sufficient quantity of miasmata could gain admission into the stomach to produce disease. As to the evidence drawn from the character of the premonitory symptoms, it cannot afford any available support to this doctrine. A severe wound, or contusion, will give rise to nausea, vomiting, and immediate loss of appetite. Such phenomena, only show that the stomach readily sympathizes with impressions made on every part of the body, when of sufficient degree of intensity. With regard to the alleged insensibility of the lungs, or its limited sphere of sympathy, we might admit its justness without being reduced to the necessity of adopting the opinion that miasmata act primarily on the stomach. It is not presumed that aerial morbific agents act simply on the nervous extremities of the respiratory passages, and thus give rise to a chain of sympathetic morbid actions. It is contended, that agents of this kind pass through the lungs into the current of the circulation, or effect certain morbid alterations of the blood, in consequence of which, the lining membrane of the heart, arteries, and capillary system, is irritated, and the vascular system thrown into a state of febrile excitement. That agents of this kind are absorbed into the circulation, and act upon the system through the medium of the blood, may be inferred from a number of familiar facts in relation to the inhalation of odoriferous effluvia. The inhalation of the fumes of turpentine, of garlic, and of various other substances, of a similar character, is speedily followed by the manifestation of these odours in the urine. How are we to account for the extraordinary effects which arise from the inhalation of nitrous oxide, and of the vapour of sulphuric ether? It does not seem probable that these effects are produced by the mere action of these causes on the pulmonary nerves; for when these substances are taken into the stomach, the nerves of which are so highly sensitive, no such consequences ensue.

These facts go to show, that substances capable of affecting the animal economy, will, when admitted into the lungs in a gaseous form, promptly and powerfully exert their peculiar influence upon the system. There are no good grounds, therefore,

for denying that miasmata and contagious effluvia, may produce their deleterious effects through the same avenue. The bronchial tubes and cells, expose a very extensive surface to the impressions or absorption of such agents; a circumstance, which, it may be presumed, is well calculated to favour their morbific influence on the system. The experiments of Magendie, in relation to the effects of putrid effluvia on the animal system, may also be cited in favour of this opinion. On exposing animals to the inhalation of putrid effluvia, some suffered no injury, whilst others rapidly emaciated, and died at different intervals within twenty days. When, however, the putrid substances, from which the effluvia experimented with, emanated, were introduced into the stomach, no obvious inconveniences were experienced by the animals.* To these facts we may add, that small-pox virus, when swallowed into the stomach, will not, or, at all events, extremely seldom, infect the system; whereas, every one knows how readily the disease is communicated by inhaling the effluvia, which emanate from the bodies of those who labour under the malady.

It appears very evident, therefore, that *æriform* febrific agents act upon the system through the medium of the respiratory organs; and the facts just mentioned, render it highly probable, that they enter into the current of the circulation, and act immediately on the internal surface of the heart, arteries, and capillaries, perhaps more commonly, on some portion of the latter set of vessels.

It is not presumed, however, that agents of this kind, always, or perhaps at any time, act exclusively through the medium of the blood, in the way just stated. Any part of the organization which exposes a sensitive surface to the impressions of such causes, may, no doubt, enable them to operate injuriously on the general system. All that is here contended for, is, that morbific agents of every kind, but especially gaseous substances, do often pass into the circulation, and that being thus mixed and carried along with the blood throughout the system, they act directly on the nervous extremities of the internal membrane of the vascular system, and thus excite febrile reaction, without the previous establishment and agency of local inflammation.†

Besides the source of direct vascular irritation already referred to, there is another one, perhaps still more common and extensive in its influence—namely, retained recrementitious matter, in consequence of accidental glandular torpor or inacti-

* Journal de Physiologie, 1823.

† Dr. James Johnson, the very able editor of the Medico-Chirurgical Review, observes; "It has always been our opinion that febrific causes made their first impressions on the nervous system; but this we think does not disprove that absorption first takes place—still less that absorption is not necessary at all. *Med. Chir. Rev.*

vity. When an excretory organ is impeded in its functions, and ceases to effect a due elimination of the recrementitious matter which it is destined to cast off, the effete elements must necessarily remain in the blood, unless some other organ vicariously supplies the function of the torpid emunctory. A source of vascular irritation will thus be created; for it cannot be presumed that recrementitious matter, even in its elementary state, can long remain commingled with the blood, in inordinate quantity, without giving rise to more or less of morbid excitement. "Thus, if from certain causes the elements entering into the composition of bile, abound in the blood, a source of disorder or of irritation is present in the blood. This irritating cause must act upon those parts which are sensible to its impressions, and to which it is incessantly and immediately applied. Derangement of the whole vascular system becomes the consequence of such irritation offered to the nerves, ramified upon the heart and blood-vessels, but more especially in the organ destined to combine and to secrete, under new forms, the materials now so abundantly presented to it."* Thus, too, if the cutaneous exhalation be arrested in consequence of the sudden influence of cold, a large portion of the recrementitious perspirable matter will be retained in the circulation. If this be not removed out of the system, by the vicarious action of some other organ, the blood will become surcharged with substances, which the welfare of the economy requires to be cast off, and which must necessarily impart to it a morbific, or irritating quality. This circumstance, together with the internal congestions which usually attend torpor of the cutaneous exhalents, becomes a direct source of irritation to the heart and arteries, and consequently of febrile excitement.

With all the evidence which we possess, therefore, that the blood frequently becomes charged with substances of an irritating or deleterious character, there can, surely, exist no reasonable doubt, that fever is sometimes the result of direct and primary irritation of the heart and arteries; for it will not be denied, that agents which are capable of causing morbid impressions on the nerves of the skin, the alimentary canal, or of any other organ, will be equally capable of producing irritation in the heart and arteries, when brought in immediate contact with their internal surface; and no one, certainly, will maintain, that irritating impressions made upon the whole or a part of the internal surface of the vascular system, will not be as likely to excite that morbid vascular action which constitutes fever, as when the irritation is conveyed to this system sympathetically, from some remote local inflammation.

Evident, therefore, as it unquestionably is, that fever may,

* London Medical Repository, No. 102, p. 509.

and often does, arise from morbific impressions made *primarily* on the vascular system, it is nevertheless equally manifest, that it is, perhaps, still more frequently the result of a purely *sympathetic* irritation, proceeding from local irritation or inflammation pre-established by the febrific cause. This latter mode of febrile origin, is, according to some modern pathologists, the only possible way in which fevers can arise; as if morbific impressions made *directly* upon the blood-vessels, could be less apt to derange their functions, than when *communicated* to them sympathetically through the medium of the nerves. It is probable, however, that the primary morbid condition whence the sympathetic febrile actions emanate, consists much more frequently in mere irritation or functional derangement, than in actual inflammation. I presume that those febrific causes which do not make their impressions directly on the lining membrane of the heart, arteries, or capillaries, by being admitted into the circulation, cause, in the first place, irritation and consequent functional derangement in one or more important organs or structures of the system. In consequence of this local irritation or deranged action, the equilibrium of excitement and of the circulation becomes disturbed, the vital properties deranged, and the sanguiferous system finally brought into a state of febrile reaction.

Fever, as has already been observed, always, perhaps, commences by a local irritation, or morbid excitement. Even when the disease results from causes that act immediately on the internal surface of the vascular system, the irritation, or primary morbid excitement, is probably confined, at first, to a comparatively small portion of this system. Every agent, whether morbific or medicinal, appears to have a tendency in its ulterior operation to affect particular organs or structures in preference to others. On whatever part of the system the primary impression is made, the excitement produced, is chiefly conveyed to some particular organ or part, according to the peculiar character of the primary impression. Ergot, whether received into the stomach, or injected into the rectum, produces an excitement in the nerves of the part to which it is applied, which is especially conveyed to the gravid uterus, and so far as can be perceived, to no other part. The infusion of jalap, introduced into the circulation, will act upon the alimentary canal, and produce purging; cantharides, whether taken into the stomach or applied to the surface, is apt to inflame the neck of the bladder; and, in short, the influence of almost every agent appears to possess a kind of elective affinity for some particular organ or structure of the organization. That this should be the case, might indeed be inferred from physiological principles, independent of the evidence of experience. That each organ and structure of the animal system is endowed with a peculiar modification of the

vital properties, may be regarded as an established fact in physiology. In this principle we may perceive the reason why different agents manifest peculiar tendencies to act on different parts of the system. Without doubt, when an impression is made on the system, it will be most felt by that structure, whose specific or peculiar vital properties are most in relation with it. When an impression is made on the nervous extremities of any part of the body, the excitement produced is conveyed by the nerves to the brain, and from this organ, it is reflected or radiated throughout the whole nervous system. That this is the ordinary course of nervous excitement from impressions made on the sentient extremities, will scarcely be disputed by any one who has carefully attended to the functions of the brain and its appendages. It is impossible to give a rational explanation of many sympathetic phenomena, unless we trace the course of nervous excitement from its origin, to the brain, and thence to the part which manifests the sympathetic action. If, then, each organ and structure of the animal system be endowed with its peculiar modification of *excitability*,* we may justly presume, that some parts of the organization will be insensible, whilst others will be more or less sensible to particular impressions, and consequently there will be some parts in which a new excitement will be produced by the impressions reflected by the sensorium commune, whilst, in other organs and structures no immediate effect will be produced. Thus, if tartar emetic be kept in contact with the external region of the stomach, the impression which it causes will be conveyed to the brain, which in its turn will reflect the impression throughout the whole nervous system, but as the stomach alone is endowed with a mode of feeling capable of receiving this peculiar impression to a prominent degree, it will be in this organ that its effects will be most conspicuous.†

Let us suppose, then, that a febrific agent acts primarily upon the nerves of the stomach, or of the skin, or of any other part of the body. The impression produced, will be conveyed to the

* The word excitability is here used to express the power of being excited into action, and includes both sensibility and contractility.

† The author of a Review of the first edition of this work, doubts the correctness of this assertion. It must be admitted, that tartar emetic, when applied to the external surface, very rarely produces either nausea or vomiting. I have, nevertheless, met with one remarkable instance of this kind. At three different periods a solution of this article was applied to the epigastrium, and at each time he experienced very distressing and protracted nausea. The general fact, however, which it is intended to illustrate by the above observation, cannot be disputed. It is well known, as has been observed in the preceding page, that to whatever part remedial substances are applied, they manifest the same tendency to act on particular organs or structures, as if they were taken into the stomach. I have known tobacco applied to the feet to give rise to nausea and vomiting, and every physician must have observed similar facts.

sensorium commune, whence it will be reflected throughout the whole nervous system. But as the various organs and structures of the system are endowed, each with its own peculiar modification of the vital properties, some may be insensible, whilst others, perhaps, are peculiarly susceptible of receiving and responding to the reflected morbific impression; and these, it may be reasonably presumed, will be irritated and functionally deranged, before the other organs or structures become affected. From the part thus primarily irritated, the morbid excitement passes from organ to organ, or tissue to tissue, according to their various sympathetic relations with each other, and with the part primarily affected, until the whole system becomes morbidly excited.

It is extremely improbable that the morbid excitement or impression caused by a febrific agent, can ever bring every part of the system, simultaneously, or *pari passu*, into a state of morbid action. The direct influence of the remote or exciting causes of fever, do not, probably, extend beyond the simple impression which they make on the sentient extremities. Every subsequent morbid change in the development of fever, must depend wholly on the relative affinities of the various structures with each other, and with the character of the primary impression; and, from what has been said above, it can scarcely be doubted, that the primary impression or nervous degrangement, resulting directly from the action of the morbific cause, always terminates in the production of prominent morbid excitement in some particular organ or structure, preliminary to the actual development of the general febrile vascular reaction.

That the primary morbific impressions are, however, almost universally directed upon the mucous membrane of the alimentary canal, as is asserted by Broussais, appears to be as far from truth, as that all fevers are purely symptomatic. Almost every organ or structure of the system may, without doubt, be the first to suffer functional derangement or irritation from external morbific impressions. The lungs, the liver, the brain, or the skin, &c. sometimes receive the reflected impressions, and become the primary focus, whence the febrile actions emanate. Observation, moreover, discountenances the opinion, that the primary local derangement thus produced, amounts often to the grade of inflammation. Deranged or irritated excitement of an organ or structure, may be adequate to set on foot a train of morbid changes, which will ultimately terminate in febrile reaction. A draught of cold water, while the body is in a state of free perspiration, may, in its ultimate consequences, establish fever. In this case the impressions of the cold water on the nerves of the stomach, are transmitted through the medium of the sensorium commune, to the cutaneous exhalents and capillaries. A state of torpor and functional derangement of these ves-

sels, together with deranged sensibility of the cutaneous nerves, immediately ensue, and the patient experiences a sense of chilliness, with more or less constriction of the extreme vessels. These, then, are the first sympathetic phenomena arising from the influence of the remote or exciting cause; and from these morbid changes, others proceed in regular sequence until the fever is fully developed. Thus, from the torpor of the exhalents and diminished circulation in the external capillaries, three pathological conditions necessarily arise, which tend especially to excite febrile reaction. In the first place, a large portion of recrementitious perspirable matter will be retained in the circulation; secondly, the retreat of the blood from the extreme vessels will cause it to accumulate in the heart and large internal vessels; and thirdly, the action of the liver* and other internal organs, will be more deranged in consequence of their direct sympathetic relations with the cutaneous exhalents.

But although the organs which sustain the primary irritation—and from which the morbid febrile changes are diffused throughout the system, as from a centre, are not, perhaps, at first in a state of actual inflammation, yet, as they are already morbidly irritable and irritated, they will be especially apt to pass into a state of complete inflammation soon after the febrile reaction is established, and an increased momentum given to the blood. It may be observed, too, that when a morbific cause acts directly on the stomach, as in the example just assumed, the fever will be apt to become early complicated with conspicuous irritation or inflammation of the mucous membrane of this organ; in consequence of having sustained the direct injurious impressions of the remote cause, and consequently, being, from the very onset of the disease, in a morbid condition.

It must be remembered that inflammation consists not only in congestion of the inflamed capillaries, but also in an altered or morbid condition of their vital properties; and hence, when an organ is already in a state of morbid excitement or irritation, inflammation will very readily ensue, when, by a general increased momentum of the circulation, the blood is urged into the debilitated and morbid capillaries. It is on this account that we so often find inflammation supervening in the stomach and intestinal canal in fevers. The mucous membrane of these organs being so much exposed to the action of irritating causes, is far more frequently the seat of irritation than any other structure of the system, and it is almost invariably in a more or less deranged condition in all general diseases. This being the case, it is evident, that this structure must be especially liable to secondary

* Vide Johnson on the Diseases of Tropical Climates. Of the correctness of his sentiments, concerning the influence of what he calls the cutaneo-hepatic sympathy, I entertain no doubt.

inflammation in febrile affections; and this, in fact, is fully confirmed by experience.

Inequilibrium of the circulation and excitement, is one of the most important characteristics of fever. Although fever is emphatically, a general malady, and a morbidly excited condition, it must not be supposed, that every sensible and irritable structure, though functionally deranged, is in a state of *increased* excitement. While the heart and arteries are energetic, and morbidly active, the muscular system is usually languid, and enfeebled. An increased activity of the intestinal capillaries and exhalents, may be attended with diminished activity of the capillaries and exhalents of the external surface. Inordinate action of the kidneys is often accompanied with torpor of the liver, and always with torpor of the cutaneous exhalents. Sometimes the capillary system is inordinately active, whilst the heart and arteries manifest but little or no increase of excitement; and occasionally the brain and nerves are in a state of great activity, with very feeble reaction of the heart and arteries. The same observations apply to the distribution of the blood. Whilst it is morbidly deficient in some organs, it will be excessively abundant in others; whilst the capillaries of one structure or organ are engorged and inflamed, those of other parts will be devoid of the regular portion of the circulating fluid. These facts have a most important bearing on practice; for they point directly to the fundamental principle of treatment,—namely, to excite and invigorate those organs that are torpid, at the same time that we depress and debilitate those that are morbidly active.*

It has been supposed that febrile excitement, or the essential morbid action of fever, is always the same; and that the various modifications which this form of disease is known to assume, depend wholly upon the local irritation or inflammation which may occur, or rather the organ or structure which may be its seat. To a certain extent, this opinion appears to be well founded. It is very evident, for instance, that in proportion as the brain and nerves become affected, so will the fever acquire a low or typhoid grade in its general character. Of two individuals seized with fever from the influence of atmospheric vicissitude, one will, perhaps, be affected with a low or typhoid form of fever, whilst in the other, the fever will assume a high grade of inflammatory or synochal reaction. In the former, prominent symptoms of severe nervous disorder will attend; and if the disease be violent, decided manifestations of cerebral inflammation will probably occur. In the latter case, little or no prominent signs

* Upon this point, and upon the subject of fever in general, I have derived some very interesting hints from my friend Professor Drake, of the Miami University.

of cerebral disturbance or irritation will ensue; but instead of this, symptoms of local inflammation in the fibrous or serous structures, or in one or more of the abdominal organs, will probably be observed.

That the occurrence of irritation or inflammation of the brain, should impart a low and typhoid character to fever, and thus give to it a peculiar aspect, is by no means difficult to comprehend; for, it is manifest, that when the fountain of the vital energies, the brain, is prominently deranged, all the powers of life, however excited, must languish and sink. This subject will, however, be more particularly discussed under the head of continued fever, being referred to at present, merely for the purpose of directing the reader's attention to the general fact, that fevers, arising from the same cause, and essentially identical, receive important modifications from the seat and grade of the local affections which may supervene.

The mode in which the occurrence of local inflammation may be favoured during the progress of fever, has already been mentioned. Besides the peculiar influence of the remote causes, in deranging particular organs or structures, in preference to others, and thus laying the foundation for local inflammation, there are, however, other circumstances which are, perhaps, still more commonly concerned, in favouring the supervention of inflammation, and inviting it to particular organs. The human system is rarely found in so perfect a state of health, as that some of its various organs or structures are not more or less debilitated or disturbed. The multifarious influences that are continually operating on the animal economy, do not suffer the vital machine to go on without some, though often imperceptible, derangement in one or more of its various organs. Add to this, the congenital debility of some structures, and the constitutional prepotency of others, and we have a sufficient number of latent causes, (varying in different individuals, and in relation to some, in the same individuals at different periods,) to determine the occurrence of local inflammation, when the nervous and vascular systems are thrown into a state of tumultuous excitement.

Much variation occurs in different cases, as to the period after the commencement of the febrile changes, when local inflammations of this kind supervene. If any organ or structure happen to be especially predisposed to inflammatory excitement, or when the exciting cause is of such a nature as to act with great force upon some organ or structure, inflammation may commence with the onset of the febrile vascular reaction. More commonly, however, the local inflammation does not supervene until several days after the commencement of the fever; and in many instances, not until the latter period of the disease. The occurrence of local inflammation in general fevers, of course,

always greatly increases the obstinacy and danger of the disease; and this is pre-eminently the case, when such inflammations supervene in fevers of typhoid character.

Prone as febrile affections unquestionably are, to give rise to secondary inflammations, many instances occur which remain entirely free from inflammation throughout the whole course of the malady, although irregular determinations and inequilibrium of excitement appear to be inseparably connected with this form of general disease.

It has been observed above, that fevers, essentially identical in the nature of the general febrile excitement, often assume prominent modifications, apparently radically diverse from each other, in consequence, solely, of the different organs or structures which happen to sustain the principal force of the malady. From this unquestionable fact, some pathologists have inferred that there can be no fundamental and specific diversities of fever, presuming that the general febrile excitement is always essentially the same; and that all the diversities which occur in the course and phenomena of this mode of disease, are invariably the result of the diverse local affections that may accompany the malady. It appears to me, however, that the occurrence of original and specific diversities in the nature of febrile excitement, is susceptible of very plausible, and, to me at least, sufficiently satisfactory illustration. It is impossible to conceive, why the capillary system of blood-vessels, in which doubtless all the essential febrile actions reside, should not be as susceptible of radical diversities of excitement as the nervous system itself. Upon this point we may be allowed to refer to the exanthematous affections; for, whatever Broussais and his followers may say to the contrary, some of these diseases are, at least in the first stage, simply febrile, without local inflammation. In the general phenomena of the fever of distinct small-pox, during the first day of its course, there is nothing that is different from an ordinary synochus; and yet no one can for a moment seriously doubt, that the essential morbid excitement of the extreme vessels in this affection, is specifically distinct from that of all other febrile diseases. It is true that this disease is produced by a specific cause; but the morbific impressions made by *malaria*, are probably as distinct from those of cold, as the impressions of small-pox virus are from those of either of them. No one has ever observed yellow fever or the plague to arise from atmospheric vicissitudes; and *malaria* by itself, has, I presume, never been known to give rise to inflammatory rheumatism, or to simple catarrhal fever. If, then, in relation to the exanthemata, general febrile excitement is unquestionably susceptible of radical and specific peculiarities, the possibility of such fundamental diversities in the nature of the morbid excitement of

fever, independent of accidental local affections, must be admitted, even in the general fevers, usually denominated idiopathic. It is probable, that *koino-miasmata*, *idio-miasmata*, and *cold*, or atmospheric vicissitudes, produce each its peculiar mode of morbid excitement; for, although the general and obvious febrile actions, and even the accompanying local affections which they respectively produce, may not be perceptibly diverse, yet, it may be presumed, the fundamental morbid condition or excitement of the nervous and capillary systems, upon which the febrile phenomena depend, is in each variety of fever, radically distinct, or *sui generis*. So far, however, as the fevers occasioned by one or the other of these remote causes, differ in from and general character from each other—as, for instance, the various forms of miasmal fevers—it can scarcely be doubted, that the most common source of these diversities consists in the accidental local affections which occur, or the character of the structure most prominently deranged, or the greater or less intensity of the operation of the remote cause.

CHAPTER II.

OF THE CAUSES OF FEVER.

The causes of fever are generally divided by pathologists into *two* varieties, the *predisposing* and the *exciting*. The former are all those external and internal causes, which tend to lessen the power of vital resistance to the influence of morbific agents. The latter are those causes which excite actual disease by the deleterious or irritating impressions which they make on the animal system. There exists, however, no absolute difference in the nature or character of these two varieties of morbific causes. The same agent, or circumstance, may manifest its influence on the animal economy, either as a *predisposing* or an *exciting* cause of fever, according to the degree of intensity with which it acts, or the previous condition of the system.

Sect. I. *Of Predisposition, and Predisposing Causes.*

When, either from a general condition of the organization, or some local functional or organic defect, the animal economy is especially susceptible of the influence of morbific causes, a *predisposition* to disease is said to exist; and this predisposing condition may be either *natural*, or *accidental*, or *hereditary*.

As the human system is continually under the influence of causes which have a tendency to interrupt and terminate its actions, life would be but ephemeral in its duration, and harassed by constant disease, if the animal organization were not endowed with the inherent power of resisting, to a degree, the influence of injurious causes. It is by the aid of this vital resistance, that man is enabled to live through a long series of years, amidst a multiplicity of causes, which conspire unceasingly to his destruction. In relation to the degree, in which this power of resisting injurious influences is possessed, by different individuals, there exists great diversity; and hence the various degrees of constitutional or natural predisposition to fever, which obtains among different individuals. Thus, the prick of a needle will, in one individual, cause great pain and constitutional irritation; in another, syncope; in a third, convulsions or tetanus; and in a fifth, scarcely any perceptible consequences at all.* There exists, therefore, a natural or *constitutional* predisposition to disease in some individuals, wholly independent of accidental causes, or mere casual debility; and this constitutional aptitude to disease, depends, probably, on the peculiar organization of the animal system.

Under the head of natural, or constitutional predispositions, must be ranked those *specific* predispositions, which render the system susceptible of certain specific diseases, and which are wholly lost by the actual occurrence of these maladies. These specific predispositions are especially incomprehensible and mysterious. Neither temperament, nor constitutional vigour, nor debility, nor any circumstance connected with the health of the individual, appears to have any relation with, or influence upon them.

With regard to *accidental*, or acquired predisposition, observation has not left us so entirely in the dark. According to the late Dr. Rush, general or local debility, accompanied by an increased excitability, constitutes the state of predisposition to fever. Without doubt, general debility, with increased excitability, must render the system more liable to the action of irritating or exciting causes; yet it does not appear, that this condition of the system can, with propriety, be considered as constituting the essential state of the organization which predisposes to fever. It is well known, that the most robust and healthy individuals, are generally the first and most certain victims of febrile epidemics. The vigorous and healthy are often prostrated under the devastating dominion of pestilence, and even under the less ruthless sway of the milder paludal fevers, whilst the feeble and the valetudinarian pass along untouched. It may,

* Sur le differens Degrees de Resistance vitale dans les Maladies, &c. Par M. L. Martinet, M. D.—*Revue Medicale, Oct'r.* 1824.

moreover, be observed, that in the feebleness of convalescence from bilious, typhus, and other forms of fever, fresh attacks, or relapses, are by no means so common as one would expect, if mere debility constituted febrile predisposition. When we wish to obviate fever, after a surgical operation, we reduce the system by low diet, purgation, and perhaps blood-letting.*

In a general way, every cause, capable of deranging the health of the animal economy, may, when acting with moderate force, produce such a change in one or more organs, as will predispose the system to fever, requiring only some further exciting cause to evolve actual febrile disease. Predisposition, produced by the influence of accidental causes, consists, probably, always in more or less functional derangement of one, or at most, a few structures or organs, or in a disturbance of the healthy balance of excitement and the circulation. I have already stated some reasons which render it highly probable, that the impressions of every morbific cause, on whatever part of the system primarily made, is, in the first place, reflected upon some particular organ, according to the nature of the impression, and the organic sensibility of the various parts of the system. If this be correct, it is manifest, that if the morbific impression, thus reflected upon an organ or structure, be too weak to establish a sufficient degree of irritation to excite general derangement, or febrile reaction, the result will be only a slight degree of insulated functional derangement, or irritation, which, though not manifested by any feelings or appearances of ill-health, is still an incipient link of disease, and wants only some additional morbific influences to enable it to put in motion the latent train of morbid sympathies. How greatly mere functional derangement of an important organ aids the causes of fever in developing disease, is often conspicuously illustrated by the influence of digestive derangement in the production of fever. Let but this citadel of the animal system languish, and the enemies of human health will speedily attack the outposts, and make an easy conquest of the whole. Hence, of all the precautions which those who visit insalubrious climates may be required to adopt, the avoidance of every thing which is calculated to derange the digestive functions, is perhaps the most important.

By a well-known law of the animal economy, every agent, however deleterious, gradually diminishes, and finally almost destroys the susceptibility of the system to its influence, by long continued or very repeated action. Hence, every agent, will, *cæteris paribus*, manifest its operation with a promptitude and intensity, proportionate to the degree of previous immunity from its influence. It is this circumstance which causes the

* Richter's Specielle Therapie. vol. I. p. 36.

difference of predisposition to endemial fevers, between the acclimated natives of insalubrious regions, and strangers arriving from northern latitudes. This variety of predisposition depends in no degree on a want of constitutional vigour or general health. The robust and healthy, are, in general, as much, if not more, under its influence, as the weak and infirm. By a gradual or protracted exposure to morbific agents, the animal economy loses, insensibly, its natural susceptibility to their influence. When such a change is effected by the combined operation of climate and endemial morbific agents, the system is said to be acclimated or seasoned, and the individual, thus seasoned, enjoys a comparative immunity from the diseases of the climate.

Besides the foregoing source of predisposition to disease, from causes peculiar to hot climates, there is another and perhaps not less powerful one—namely, *atmospheric heat.* High atmospheric temperature, is, strictly speaking, rather a predisposing than a morbific agent in relation to its influence on the human system.* In this respect it exercises a very powerful influence in the production of diseases. Long continued exposure to an elevated degree of solar heat, tends, very considerably, to increase the general irritability of the system, and to lessen the power of vital resistance. Hence, the frequency of tetanus in hot climates, from injuries, or from the influence of the cool and damp night air ; and hence too, the greater liability to this and other irritative affections, during the hot seasons of our own climate, than in the cold months. Atmospheric heat tends, moreover, to predispose to fever, and other affections, by the profuse and continued perspiration it causes, as well as the redundant secretion of bile it is apt to excite. By these over-excited actions of two important organs, the general system is exhausted, whilst the organs themselves are rendered more susceptible to the injurious impressions of one of the most common and powerful exciting causes of disease—namely, *cold.*

In relation to those predispositions to disease which are transmitted from parent to offspring, it may be sufficient to observe, in this place, that they depend, no doubt, on a peculiar physical condition or intimate state of the organization, which we may presume, is as apt to be imparted by the parent to the offspring, as the contour of the countenance, or of the general structure of the body.

Sect. II. *Of the sources of Morbific Causes, and their General Character.*

When we take a general survey of the source of all the possible causes of disease, we find that, in relation to their origin,

* Dr. James Johnson on Tropical Climates, &c.

they range themselves under the following four general heads, viz.*

I. *Recrementitious substances,* which, in health, are separated and thrown out of the system, but being retained in the circulation, or reabsorbed, become a source of irritation to the sanguiferous system, and, therefore, of irritative diseases. These morbific causes are always *secondary*, being, themselves, the consequences of an anterior injurious cause or impression. Thus, the retention of the perspirable matter, can occur only in consequence of the influence of some previous cause, adequate to disturb or arrest the action of the cutaneous exhalents. The recrementitious fluids, which appear to be most injurious to the animal economy, when retained in the circulation, even in their elementary forms, are the perspirable matter, the bile, and the urine; and of these the first is, perhaps the most frequently concerned in the production of disease. The influence of causes of this kind in the development of disease, is, probably, much more extensive than is generally admitted in etiological inquiries. In all that extensive class of febrile affections which arise from the influence of cold, retained perspirable matter performs, probably, a principal part in the development of the irritative vascular excitement.

Checked perspiration, or, more correctly speaking, inactivity of the cutaneous exhalents, constitutes the initial link in perhaps, three-fourths of our febrile diseases. Let it not be imagined, that, as the recrementitious substances which are retained in the circulation are in a simple or elementary state, they cannot possess powers sufficiently irritating or active to excite morbid vascular action. In whatever form these substances may exist in the blood, they are still recrementitious, and it is not to be presumed, that materials of this character, could be long retained without an injurious influence on the animal economy. Accidental torpor of one emunctory, is often vicariously supplied, by increased activity of another, and disease thus prevented. Thus if, after the cutaneous exhalents have been rendered torpid by the sudden influence of cold, the flow of urine becomes unusually copious, disease will rarely ensue. Indeed, the ALL-WISE and BENEVOLENT CREATOR, has provided against the injurious consequences, which must otherwise have resulted from the constant changes to which the function of the skin is necessarily exposed by placing in the interior, an organ, whose functions may, in a great degree, supply any accidental deficiency in the action of the former.

* Richter's Specielle Therapie, vol. I.

II. *Irritating substances, generated within the body, but wholly independent of any organic actions.* These causes of disease are usually generated in the primæ viæ, and consist of worms, acids, mucous, and various other irritating substances, resulting from the fermentative or putrefactive processes.

Worms have been, and by some are still considered as innocent inmates of the human body. This, however, is most certainly an erroneous sentiment. Without doubt, a few, or even a considerable number of worms lodged in the alimentary canal, may not be able to disturb the general system, when in a state of good health and constitutional vigour; but when the body is debilitated and irritable, as it commonly is during the period of dentition, the presence of worms in the intestinal tube will frequently give rise to the most alarming affections. Worms tend, moreover, to sustain and protract fevers produced by other exciting causes; an inattention to which, frequently renders the progress of ordinary diseases peculiarly perplexing and unmanageable. It is not uncommon to meet with cases of slight febrile disease in children from cold, which continue in spite of appropriate remediate efforts, gradually assuming the form of slow remitting fever, with a foul tongue, and gastric disturbances, and at last, suddenly assume a favourable aspect, on the expulsion of a few large lumbrici.

The agency of causes of this kind in the production of *fever*, was, however, formerly considered much more extensive than it appears, in reality, to be. Verminous epidemic fevers are described by some of the older writers, and saburral fevers were supposed, as it would appear, very common. Without ascribing so great an importance to these causes, as *originators* of fever, it is, nevertheless, unquestionable that they do, at times, give rise to febrile affections, independent of all other morbific irritants. Their febrific tendency is, however, much more frequently manifested in the support, or additional violence which they give to fevers arising from other causes, than in originating febrile affections by their own immediate influence.

III. *Morbific agents, generated out of the animal body*, consisting, either of deleterious substances floating in the air, or of the sensible properties of the atmosphere, or, finally, mechanical causes—namely; miasmata, noxious gases, heat, cold, electricity, humidity, and mechanical injuries, &c.

IV. The fourth and last class of morbific agents comprehends those which are *generated by morbid organic actions of the living system, constituting the various contagions.*

The principal causes, embraced under the two last heads, are so

extensive in their influence on the human system, and so interesting and important, both in a medical and scientific point of view, that a separate and full exposition of their respective modes of origin, and physical, as well as morbific characters, will not be deemed inappropriate in a work of this kind.

Section. III. *Atmospheric Temperature, and its relations with the Animal System.*

A certain quantity of heat is indispensable to life, throughout the whole range of organized beings. Every animated being possesses an inherent power to generate heat, and to resist, to a certain extent, the physical law of the distribution of heat; and, consequently, to maintain its peculiar or specific temperature, when placed in a medium either many degrees below or above its own temperature. The constant and rapid reproduction of heat by the vital powers, keeps up the natural temperature of the animal body, although surrounded by a medium which abstracts its heat, with great rapidity. Such, indeed, is the evolution of heat by the human body, that an atmosphere of the temperature of 98° is generally oppressive and unpleasant by the feeling of warmth which it causes, although at this temperature of the air, no heat can be communicated by the surrounding atmosphere to the body. The temperature most grateful and invigorating to the human system, ranges from about 60° to 65°. "This temperature of the air appears to abstract the heat of the body in about the same proportion in which it is generated in the healthy state of the system; and this degree of the temperature is, therefore, the most congenial, for it neither exhausts the vital powers, nor gives rise to unpleasant sensations."

There exists, however, considerable diversity in the human constitution, in relation to the power of supporting the extremes of temperature. This depends not only on the original vigour of the system, but also, greatly, on the influence of habit and modes of living. A person endowed with a vigorous constitution, and with habitual good health, will bear a degree of cold without any unpleasant feelings, which, to one of a feeble and exhausted system, will be a source of painful sensations and indisposition. Habit, in relation to previous exposure, has a powerful influence in varying the effects of temperature on the animal system. The same temperature will cause feelings of severe cold or great warmth, according as the body has been previously exposed to a high or low temperature. Whenever the surrounding medium abstracts the heat of the body more rapidly than it is generated by the regular actions of the animal economy, the sensation of cold will be produced; and the intensity of this

sensation will always be proportionate to the *rapidity* with which the heat is abstracted, and the feebleness of the heat-generating power of the system.

I. *Physiological effects of cold.* When the temperature to which the human system is exposed, is so low as to give rise to the sensation of *cold*, its immediate effects are ; 1. *Diminution of the action of the cutaneous exhalents*, and of the external capillary blood vessels, giving rise to a pale, shrunken, and dry state of the skin. 2. *Diminished action of the heart and arteries—manifested* by smallness, weakness, and *slowness* of the pulse. In relation to the effects of low temperature on the *frequency* of the pulse, however, there exists some discrepancy of opinion among physiologists. From the experiments of Drs. Stock, Spooner, and M'Donnel, it would seem, that although the strength and size of the pulse is diminished by cold, yet its *frequency* is considerably increased. Against these experiments we may oppose those performed by Currie, Rush, and Klapp;* and in my own experiments I have invariably found the pulse diminished, both in frequency and in volume, when cold was applied to any particular portion of the body.† 3. *Diminished sensibility* of the external parts, passing by degrees, throughout the whole system. Hence, the benumbed state of hands, fingers, and other external parts, the torpor of the sensorial functions, and the sluggishness and feebleness of muscular action which occur from the protracted influence of severe cold; and in this way, too, an almost irresistible inclination to *sleep* occurs, when the cold is very intense. Artificial somnolency has been produced in certain animals by exposing them to a very low degree of temperature. 4. When moderately applied, cold *increases the powers of the digestive organs.* Hence the aphorism of Hippocrates, *Hieme ventres calidiores sunt.* The appetite increases, and the process of digestion is performed more rapidly in moderately cold and dry than in warm weather. We are informed by Xenophon, that the Greek soldiers on their return from Asia, were exceedingly harassed by the most severe sensations of hunger, while passing the snow covered mountains

* That Dr. Stock and the other experimenters observed what they record upon this point, cannot be doubted. We can readily admit that when the body is suddenly plunged into cold water, the mode adopted by them, the pulse will at first be accelerated. It must be observed, that when the body is *suddenly* immersed in cold water, the blood is violently driven in upon the heart and larger vessels, and the respiration is performed in a hurried and imperfect manner, in consequence of which, the heart is excited into a temporary exertion to overcome the load which oppresses it, and the pulse consequently at first accelerated.

† The pulse of the inhabitants of northern climates is habitually slower than the ordinary standard of frequency in the middle latitudes. Amongst the Greenlanders, it is by no means uncommon to find the pulse as slow as 40 and 45 in a minute.—*Beaupré on the Effects and Properties of Cold*, p. 50.

of Armenia, although they were allowed their ordinary rations of food. When cold becomes very intense and protracted, however, the digestive, as well as all the other organs of the system, become enfeebled and inactive. 5. The *sudden* application of cold, causes a hurried, irregular, and imperfect action of the respiratory apparatus; and when intense, it checks or impedes the efforts to dilate the chest, and these effects increase, *pari passu*, with the increased influence of the cold, until at length respiration is performed so imperfectly as to prevent the due decarbonization of the blood, and the whole organization sinks into a state of torpor and insensibility. 6. *Moderate cold is favourable to nutrition.* "Man and all animals are fatter in winter than in summer; and in the north than in the south." When, however, the cold is applied in an intense grade, and prolonged in its influence, the process of nutrition is disturbed and interrupted. 7. The pulmonary exhalation, and the secretion of urine are increased by cold, and supply, in a degree, the checked exhalation by the skin from the same cause.

Stringuntur tubuli pellis, coguntur et intus
Tot variis pellenda viis excreta, &c.

8. Cold, when prolonged in its influence, diminishes the *venereal propensity*. (Montesquieu, Esp. des loix B. 14. C. 2,) but it does not appear to repress the function of generation; for, although the venereal appetite be less constant and urgent in cold than in warm climates, yet the power of procreation would seem to be even greater in the former than in the latter. "In Sweden it is not uncommon to see women have twenty or thirty children; and in Russia marriages are followed by a numerous progeny."* 9. Cold retards the development of the sexual organs, and the period of pubescence, more especially in the female sex. In northern latitudes the catamenia rarely commence before the sixteenth or seventeenth year; whereas, in the ardent climates of the intertropical countries, the menstrual evacuation is apt to make its appearance as early as the twelfth and not unfrequently as early as the tenth year of age.

Cold is, therefore, a sedative agent; for, although, when moderately and transiently applied, it is generally followed by phenomena attributable to a stimulating influence; yet these are not, strictly speaking, the *immediate* consequences of the low temperature, but rather of the *reaction* of the *vital ener-*

* Beaupré, *on the Effects of Cold*, &c. p. 88. "In the coldest regions, approaching the poles, excessive cold retards the generative flame, and we may say extinguishes the lamp of physical love. Beyond the 65th degree of latitude, population continues to decrease, and ends at Spitzbergen and Nova-Zembla. Lapland and Iceland females are said to menstruate but little; they are apathetic in love, and know but little of the bitter feelings of jealousy, or the vehemence of sexual attachment."

gies, after the temporary reduction of their activity by the cold. When an agreeable glow, and augmentation of the general vigour is experienced after leaving a cold bath, it arises, probably, not from the direct stimulus of the cold, but from its having depressed the excitement of the surface, and increased the susceptibility to the action of stimuli; in consequence of which, the ordinary influence of the atmosphere, the warmth of the clothing, and even the stimulus of the blood, as well as exercise, and other usual exciting influences, will cause an increased degree of excitement, more especially in the cutaneous capillary system. That the phenomena of increased activity and vigour, which sometimes ensue, are solely the consequence of a *reaction* in the system, after the cold has temporarily diminished the excitement, and thereby increased the susceptibility to subsequent excitation, is fully demonstrated by the fact, that unless the system be endowed with a considerable degree of energy and activity, no such favourable effects will follow the application of cold. If cold produced these effects by its *stimulating* powers, it would, one may reasonably believe, produce them when the system is in a *state of feebleness;* because mere weakness can never annul the operation of a stimulus, provided the excitability be not exhausted. That cold must necessarily diminish the actions of the system, is evident from its being, in fact, nothing else than a comparatively diminished grade of temperature. For if heat be a stimulus, it is manifest that this stimulus must be lessened in its powers, just in the ratio in which its intensity is decreased. Thus, if 80° produce a certain degree of excitation, 60° *(cæteris paribus)* must produce a less degree, and 40° still less, and so on. Correctly speaking, every agent capable of affecting the animal economy, is a stimulus; but when we speak of cold, and its effects, it is to be always understood in a relative sense; for when it is said that cold is a sedative, it can mean nothing else, than that it is less stimulating than a higher degree of temperature.

It is to be observed, however, that although cold unquestionably tends to diminish the actions of the system, yet, when applied suddenly, it often manifests a very conspicuous exciting agency on the nervous or sensitive system. Thus, a few drops of cold water sprinkled on the face of a person in a state of syncope, or approaching to this state, will generally produce immediate excitation and return of consciousness. In asphyxia from carbonic acid, or electricity, too, cold water dashed on the face and breast, often causes immediate respiration, and other manifestations of returning life. In cases of this kind, the sudden *sensation* which the cold produces, acts, probably, as the exciting cause.

2. *Cold as a morbific agent.*—Cold is, perhaps, the most

common and frequent of all the remote causes of disease in the temperate latitudes. Its injurious tendency appears to be much enhanced by being conjoined with humidity; for, a very *dry* and cold air is far less capable of abstracting the animal temperature, than low temperature united with humidity. But the most important circumstances which render the impressions of low temperature prejudicial to the animal economy, relate to the previous condition of the system itself, with regard to the cutaneous transpiration, and antecedent exposure to high temperature. The morbific influence of cold, is always efficient in proportion as the body has been previously exposed to an elevated temperature; and, more especially, in proportion as the perspiration is more or less copious. The most powerful of all the predisposing conditions of the animal system to the injurious effects of cold, is a state of free perspiration, from fatiguing and exhausting exercise or labour, under the influence of high solar heat. In this state of the body, and scarcely in any other, the sudden application of cold to a large extent of the surface, or to the stomach, in the form of ice or cold water, will often suddenly produce the most alarming, and even fatal, consequences.* When the animal temperature is not rapidly carried off by free perspiration, and the system not debilitated by fatigue, cold can never give rise to such sudden, violent, and dangerous consequences. The effects here alluded to, as resulting from the impressions of cold, while the body is in a state of free perspiration, from fatiguing exercise and atmospheric heat, appear to be of a nervous or spasmodic character, consisting generally in sudden prostration and effacement of the vital energies of the system. As a *febrific* cause, cold plays a very important part in the production of disease. It is not, however, merely *cold*, or low temperature, that is most influential as a febrific cause; *vicissitudes of temperature*, sudden changes from warm to cold, or from cold to warm weather, are the sources whence febrile disease is so abundantly derived; and these changes are always injurious in proportion to the suddenness of the transition, and the greatness of the change. A very gradual change of atmospheric temperature rarely produces disease, except in such as are peculiarly predisposed to influences of this kind. The mode in which cold produces fever has already been explained. Its first effects on the system is torpor of the cutaneous exhalents, and a retreat of the blood from the surface to the internal organs. The recrementitious perspirable matter is thereby retained, and the blood rendered more irritating, or at least, surcharged with offensive substances. In consequence of these morbid conditions, the heart is excited into increased action, by which the

* Rush's Medical Inquiries. Currie's Medical Reports.

blood is again propelled into the external capillary system, without, however, overcoming the torpor of the exhalents. If any portion of the capillary vessels be predisposed, by previous debility to morbid excitement, high vascular irritation will be apt to occur in this part, and probably to the extent of actual inflammation. Should the mucous membrane of the respiratory passages be predisposed to irritation, catarrhal or pneumonic affections will be the consequence. If the alimentary canal be in a state of accidental or habitual irritation, dysentery or enteritis will probably occur. In short, whatever part of the system may be in a condition peculiarly predisposed to disease, inflammation or high vascular irritation, will most likely be developed in it, by the increased momentum of the circulation, and the immediate local impressions of the recrementitious elements retained in the circulation.*

When the degree of cold is excessive, or very prolonged in its action on the animal system, it gradually abstracts the animal temperature to a degree incompatible with vital action, and *asphyxia*, *gangrene*, or *death*, ensues. The tendency which very low temperature has to produce these effects, is greatly controlled by the degree of constitutional energy, as well as the degree of corporeal exercise, of those who are exposed to its prolonged influence. A person of a vigorous and healthy habit of body, will readily bear a degree of cold without particular injury, which would soon destroy an individual of a weak and infirm state of the system. In all instances where cold is applied in a degree capable of gradually reducing and finally arresting the vital actions, an indomitable *inclination to sleep* supervenes just before the fatal torpor comes on. When this oppressive somnolency ensues, all feelings of pain or suffering cease—and if it be not resisted, death is inevitable.

Heat.—High atmospheric temperature acts much more frequently as a predisposing than an exciting cause of disease. "Solar heat," says Dr. James Johnson, "produces only the predisposition, while terrestrial exhalations and cold, call into action the principal diseases of hot climates. The mode in which solar heat contributes to the production of disease, appears to be either by augmenting the general irritability of the system, or, more generally, by exciting inordinate functional action of the *skin* and the *liver*, and thereby rendering them more susceptible of the paralyzing impressions of cold. Between the skin and the liver there exists a close and powerful sympathy, in consequence of which, whatever excites the functions of the former, produces, perhaps, an equal increase of the functions of

* Dr. James Johnson, *passim*.

the latter organ."* Hence, high atmospheric heat very generally produces an increased secretion of bile, by its influence upon the liver through the medium of the skin, whose functions it is so peculiarly adapted to augment. It is manifest that an inordinate activity of these two functions from the influence of *heat*, must render them extremely obnoxious to torpor or inactivity, from the sudden application of *cold;* and it is equally obvious, that a sudden torpor of these two important emunctories cannot occur without an immediate injurious consequence upon the whole system. Solar heat is, moreover, extensively concerned as an *indirect* cause of febrile affections, by favouring the production of *marsh miasmata.* By its expansive and exciting influence, it sometimes gives rise to sudden and dangerous local determinations, particularly to the head, causing apoplexy, and that state of cerebral oppression called a stroke of the sun.

Sect. IV.—*Of Miasmata.*

The term *miasmata*, is here used as designating a highly important class of febrific agents of a *gaseous* form, which act on the animal system through the medium of the atmosphere. This *class* of agents consists of two *orders*, namely;—1. *Infection*, comprehending those febrific effluvia which are generated by the decomposition of vegetable and animal matter; and—2. Aeriform contagions, generated by the animal system in a state of disease.

1. *Infection;* or that variety of febrific agents which is produced by decomposition out of the animal system, consists of two *genera*, namely;—1. Those which result from the humid decomposition of vegetable and animal substances contained in the public filth of cities, in marshes, and in other soils and situations furnishing these materials. This genus is usually designated by the term *marsh-miasm;* but from the common or public source of these morbific effluvia, it has been proposed, and by some adopted, with much propriety, I conceive, to distinguish them by the compound term *koino-miasmata.* 2. Those febrific effluvia which are generated by the decomposition of the natural exhalations and excretions of the human body, accumulated and confined in crowded and ill-ventilated habitations. These deleterious effluvia, originating from the decomposition of matter derived from the human body, have, with equal propriety, been designated by the terms *idio-miasmata*, expressive of the personal or private character of their source.† Before

* Dr. James Johnson, *on the Influence of Tropical Climates, &c.*

† These distinctive terms were originally proposed and adopted by the late Dr. Edward Miller, of New-York, in the year 1804. He observed that there were two species of miasmata; the one consisting of febrific exhalations from

treating of these febrific agents, in an etiological point of view, it will be proper to describe, more circumstantially, the manner and circumstances in which they are generated, as well as their physical characters, so far as these can be known.

I. KOINO-MIASMATA, usually designated by the terms *marsh-miasmata*, or *malaria*. This morbific agent was not unknown to the ancient Greek physicians. They personified it under the emblem of a many-headed monster, whose devastating influence was so severely exercised over the luxuriant fields of Argolis, that it was made one of the labours of the potent son of Alcmenus to rid the country of this dreaded source of pestilence. Hercules, accordingly, drained the extensive Lernean marshes, and thus dried up this abundant source of pestiferous emanations.

Heat and *moisture* are indispensable to the generation of koino-miasmata; without these, no decomposition can take place, and without decomposition no deleterious agents can be generated from dead vegetable and animal substances. In latitudes, where the atmospheric temperature seldom rises above 60°, the diseases which arise from this agent occur but very rarely, and perhaps, never, in an *epidemic* manner. The Lithuanian marshes of Russia, do not render the surrounding districts insalubrious. It would seem, indeed, from a long series of observations, that *koino-miasmata* are seldom evolved, to a degree sufficiently copious or active, to create extensive disease, so long as the temperature of the air does not rise above 80° of Fahrenheit. It is, however, not necessary that *moisture* should be present in great *abundance* for the production of miasmata. Indeed, grounds completely covered with water, send forth but very little of this deleterious effluvium, however favourable the temperature, and other circumstances may be. Hence, copious and continued rains, by inundating marshy soils, render such

marshes and other soils, and the other of effluvia generated by the decomposition of personal and domestic filth. "In order to distinguish these two varieties of *miasmatic* agents, and, at the same time, duly to fix in the mind the impression of the origin and production of them, it is judged expedient to designate each, by terms which will, invariably, express the process of nature in their formation. As the Greek language has been generally resorted to in the framing of scientific nomenclature, I shall employ the adjective ΚΟΙΝΟΣ, *common* or *public*, to denote one species of miasma, and ΙΔΙΟΣ, *personal* or *private*, to denote the other. The application of these terms will be readily understood. That portion of the air charged with miasmata, exhaled by solar heat, from the surface of swampy ground, or from masses of filth overspreading the open area of cities, according to this distinction, is denominated *Atmosphera koina-miasmatica*. And that other small portion of air, contaminated by miasmata, emitted from, and surrounding the body, clothes, bedding, and furniture, of persons immersed in the filth of their own excretions, and of those associated in the same family with them, accumulated, long retained, and acted upon by animal heat, is denominated *Atmosphera idio-miasmatica*."—*Attempt to deduce a Nomenclature*, &c. *Med. Repository. New-York*, 1804.

localities comparatively salubrious, (Dalzille, Ferguson.) Ferguson was led to infer, from his observations on this point, that miasmata were extricated wholly independent of the humid decay or decomposition of vegetable and animal matter, and apparently without the agency of humidity. He asserts that this aeriform poison is never extricated, in any considerable quantity, until the moisture of the soil is so far dissipated as to leave the ground in the last stage of the drying process. This, however, is decidedly contradicted by almost universal experience. In proof of his opinion, among other observations, he says: "In the months of June and July our army marched through the singularly dry, rocky, and elevated country on the confines of Portugal, the weather having been previously so hot, for several weeks, as to dry up the mountain streams. In some of the hilly ravines, that had lately been water-courses, several regiments took up their bivouac, *for the sake of being near the stagnant pools* of water that were still left among the rocks. Many men were seized with intermitting fever." From this, and similar facts, he thinks himself warranted to conclude, that the humid decay of vegetable and animal matter has no immediate agency in the production of miasmata, and that moisture, particularly, is not essential. But "half dried ravines, and stagnant pools of water," are surely no evidence of a want of humidity, and present, one should think, precisely the conditions most favourable to the emission of miasmata from vegetable and animal decomposition.

It may be observed, that in every instance adduced by Dr. Ferguson, in proof, that the extrication of miasmata does not depend on the *humid* decay of vegetable and animal matter, the soil from which the miasmata was emitted had been previously thoroughly saturated with water, during the rainy season, and, moisture must, therefore, have existed in sufficient abundance, a short distance under the *surface* of the soil, however parched the latter may have been. Under such circumstances, miasmata might be abundantly sent forth, without any obvious humidity and vegetable decomposition on the surface; for the vegetable and animal remains, collected during the rainy season, must have been gradually decomposed during the drying process, and left, in part, at least, mingled with the portions of the soil on the surface. In this state, then, the slow evaporation of the humidity under the surface, in passing up into the air, would dissolve the putrid but dry particles of animal and vegetable remains, and convey them in the form of an effluvium into the circumambient atmosphere.

That a considerable degree of humidity is especially favourable, and even essential, to the evolution of miasmata, is evident from the circumstance that marshes, stagnant pools, and the oozy

shores of rivers, have, in all ages, and in all countries, been found the most insalubrious portions of the earth during the hot seasons.

As to the variety of *soil* most favourable to the production of miasmata, we possess no very definite or certain information. It has been asserted, that an argillaceous soil is most favourable for the extrication of this effluvium; but its tendency in this way, appears to depend solely on its greater compactness, in consequence of which, it retains humidity much longer than other soils, and thus favours the formation of marshes, and of standing pools of water.

It is not, however, from marshy or low and humid soils alone, that this morbific effluvium is disengaged; for "there is scarcely a spot of this earth's surface to be found, that is not covered or imbued with both vegetable and animal remains in a state of decomposition, and ready to afford pabulum for the sun's rays, with or without humidity to extricate *malaria*."* Wherever vegetable matter meets with sufficient heat and moisture to cause it to enter into humid decomposition, there, miasmata will be evolved, and in our own climate there are very few, if any, situations, that do not at times furnish all these conditions, to a greater or less extent.

A mixture of *fresh* and *salt* water in marshes, appears to enhance the copiousness and virulence of miasmata to a very obvious degree. It is a singular fact, that the water of the sea is much more apt to enter into putrefactive decomposition than fresh water; and this, no doubt, depends on the great quantity of organic matter which it contains. M. Monfalcon, mentions some interesting examples illustrative of this fact.† The extensive pool of Valdec, in the south of France, is quite saline. Not more than a few rods from it is a large pool of fresh water called *Engrenier*. When the waters of these two pools rise, and run into each other, as they occasionally do, much sickness soon occurs throughout the adjoining parts. In the vicinity of Lukes, on the south of the Ligurian Appenines, there is a large marshy plain accessible to the high tides of the ocean. The neighbouring districts were almost uninhabitable from the pestilential effluvia which emanated from this marsh, until the waters of the sea were separated from the sweet water of the marsh by means of sluices and hydraulic works, when it became healthy, and the population increased rapidly.

Of the nature of *koino-miasmata*, we possess, as yet, no certain knowledge. Examined chemically, the air of the most pestiferous marshes is found to differ in nothing from the purest and

* Dr. James Johnson, Med. Chir. Rev.
† Histoire Mèdicale des Marais. Paris, 1828.

most salubrious air. According to the experiments of Professor Julia, of Lyons, it would appear, that

1. The deleterious influence of *koino-miasmata*, depends on particles of putrid animal or vegetable matter dissolved and suspended in aqueous vapour.
2. The air of marshes does not differ from atmospheric air in any of the principles which chemical analysis can detect.
3. None of the gases disengaged from bodies in a state of putrefaction, exhibit themselves in a sensible quantity.
4. The disorders caused by *koino-miasmata*, are not in any degree dependent on the predominance of azote, of carbureted hydrogen, of ammonia, of nitrous oxide, &c. in the air.

That koino-miasmata consists in particles of putrid vegetable and animal matter, dissolved in aqueous vapour, receives considerable support from the experiments of Gaspard and Majendie on the effects of putrid exhalations on animals, and which have already been cited in a former part of this volume. Majendie found, that on exposing different animals to the exhalations of putrid animal matter, affections were produced analogous to those which are known to occur in man from the influence of pestilential miasmata. It is not improbable, therefore, that such putrid materials, suspended in vapour, constitute the deleterious principle of miasmata of this kind; and it may be reasonably presumed, that the different modifications of disease produced by this agent, in different localities, depend in a great degree on the different degrees of concentration, as well as on the particular character and proportion of the substances from whose decomposition the putrid miasmal particles are derived. It can hardly be doubted, that the relative proportions of animal and vegetable matter which may enter into miasmal exhalations, will determine the violence of their influence, and modify its results on the system. Plausible as these sentiments may be, it should not be forgotten that they are founded on no *certain* data, and that we may, after all, as yet, be remote from the truth in relation to this subject.

Whatever may be our views concerning the essential nature of koino-miasma, observation has made us acquainted with certain of its physical qualities, as well as with its general effects on the human system, and which is perhaps all that it imports us, in a practical relation, especially to know.

Koino-miasmata possess a greater specific gravity than atmospheric air, (De Lisle.) They cannot, consequently, ascend into the air without being attached to and carried up by lighter bodies; and these vehicles consist, without doubt, of aqueous vapours. Hence, persons sleeping in elevated chambers, are much less apt to contract miasmal diseases than such as are lodged on

the ground floor, (Hunter, on the diseases of Jamaica, Blane, Lempriere,* De Lisle.) And hence, too, the greater salubrity of hills, and very elevated parts, than the adjoining low grounds. The ancient Romans appear to have been fully aware of this fact, and they availed themselves of it by almost uniformly selecting very elevated positions, or hills, for the sites of their towns. It is true, that some very remarkable exceptions have occurred to this fact. Bancroft mentions the great mortality which has repeatedly been observed on the top of Montè-fortunè, at St. Lucie; and on the Hospital and Richmond hills, at Grenada, while the surrounding low situations were comparatively salubrious. Dr. O'Hallaran, in his account of the yellow fever of the south and east coasts of Spain, mentions similar examples of the great prevalence of miasmal diseases on very elevated situations, whilst the surrounding marshy grounds were but little infested with this deleterious effluvium. He refers particularly to *Monjui*, a hill 700 feet high, overlooking Barcelona, the air of which he says, is so deleterious, that it was found necessary to relieve the stationary guard every eight or ten days; and, he adds, that the injurious influence of the exhalations arising from the swamps below, manifested itself more conspicuously upon the summit of the hill than in the subjacent parts. Dr. Blane, who mentions similar facts, explains them by supposing that the vapours formed on the low and swampy grounds ascend, and, with the miasmata which they hold in solution, pass over the lower situations and impinge and settle on the neighbouring hills. It is, indeed, by no means uncommon to see fogs, which rise out of the low grounds, ascend and hover over the tops of the neighbouring mountains, and it may well be presumed, that these fogs will convey along with them a large portion of the miasmata which may be extricated from the same grounds whence the aqueous vapours arise.

Koino-miasmata is abundantly precipitated to the surface of the earth during the night, and more especially during the first hours after the setting, and shortly before the rising of the sun. Hence, in part, the greater liability of contracting miasmatic diseases from exposure between the setting and the rising of the sun, than after the sun is considerably above the horizon, (De Lisle, Bancroft, Sir James Fellows, Johnson.) The most dangerous period in the twenty-four hours of the day, is "that which accompanies the setting and that which immediately precedes the rising of the sun, and the least critical time is when

* Drs. Blane and Lempriere, in their report to the Secretary of War, concerning the Walcheren fever, observe: "On no account should ground floors be used to sleep on; the more lofty the buildings the better, for the tenants of the upper stories not only enjoy the best health, but, when taken ill, have the disease in the mildest form."—*Bancroft on Marsh Exhalations.*

the sun is at its highest point above the horizon," (De Lisle.) In these facts we have strong evidence of the correctness of an observation already made—namely, that the miasma is united with and suspended in the air by aqueous vapour, which, falling in the form of dew, carries down along with it the deleterious miasmatic particles.

Koino-miasmata may be arrested in its progress or passage from its source to other parts, by whatever is capable of impeding and intercepting the progress of aqueous vapour. Thus the interposition of a dense forest, of a high wall, or fence, of a chain of elevated hills, in short, of any mechanical obstacle of this kind, has been known to protect the inhabitants of villages, of camps, of convents, and of single habitations, from the pestiferous influence of neighbouring marshes. De Lisle relates several very remarkable facts illustrative of this observation, (Monfalcon, Bancroft.) A convent, situated on Mount Argental, near the village of St. Stephano, was, for a long time, remarkable for its salubrity, until the trees by which it was surrounded were cut down, when it became extremely sickly. From the same circumstance, miasmata are sometimes confined by obstacles of this kind, and so accumulated in particular localities, as to acquire a high degree of concentration and power. Marshes surrounded with dense forests, in warm climates, have often given unequivocal illustration of this fact. The same effect, in causing a stagnation and accumulation of miasmata, has been observed in most situations environed by high hills. In some of the valleys in the mountainous regions of South America, malaria are thus accumulated to a degree which gives them the utmost virulency, while the surrounding elevated parts are entirely free from miasmal diseases. This is remarkably the case at *Acapulco*, which, as Dr. Macculloch* observes, may be regarded as a striking instance "of the imprisonment of malaria by hills." It is in this way, too, says this writer, that we "may explain the peculiar virulence of jungles and pine swamps, and even of woods every where."

Considerable diversity of opinion has been expressed as to the distance to which miasmata may be diffused from their source, in a state of sufficient concentration, to produce fever. In a quiescent state of the atmosphere, the sphere of activity is, probably, much more limited than has been generally supposed. Bancroft thinks, that they are rarely carried beyond a quarter of a mile, even by unobstructed currents of air, in a state sufficiently active to produce fever, and he adduces several observations which seem to confirm this opinion. Unquestionably, however, currents of air passing over marshes, often convey the

* An Essay on the Production and Propagation of Malaria, &c.

miasmata, which arise from them, to a very considerable distance—sometimes several miles, in a state of concentration fully adequate to the production of their usual deleterious effects on the human system. "In Italy," says Dr. Macculloch, "the poisonous exhalations of the lake Agnano, reach as far as the convent of Camaldoli, situated on a high hill, at the distance of three miles, proving that thus far, at least, malaria can be conveyed by the winds." The account of the thirty Roman noblemen mentioned by Lancisci, is an interesting and striking illustration of this fact. They were sailing near the mouth of the Tyber, on a party of pleasure. Suddenly the wind shifted, and blew over the putrid marshes. Twenty-nine out of the thirty were soon seized with intermitting fever. The effects, often truly frightful, of the *harmattan*, after becoming loaded with the pestilential effluvia of the swamps of Benin, afford also a strong illustration of this fact. From this circumstance, it not unfrequently happens, that those who reside on the leeward margin of marshes, or sluggish streams, are extremely harassed by miasmal diseases,—while those who sojourn on the windward side, remain almost entirely exempt from these affections. Dr. Macculloch relates an instance from his own observation, which strikingly illustrates this fact. "An army was encamped in a very pestiferous plain, yet the health of the men did not suffer, because, being near the shore, the sea-breezes predominating at that season, swept back the malaria into the interior country. From some cause, the encampment was transferred to another point, without recollecting that the change of the regular winds was approaching. They did commence—sweeping in a new direction across the plain; and, within a few days, many thousand men were disabled or destroyed."

During the autumns of 1820, '21 '23, and '24, there was scarcely a family between the eastern shore of the Schuylkill, and the city of Philadelphia, that did not suffer from intermitting and remitting fevers; whilst among the inhabitants of the western shore, and of the high grounds a short distance back, there was, comparatively, but little sickness. The cause of this difference manifestly consisted in the course of the wind, which, during the periods here mentioned, as indeed is generally the case, blew almost continually from the west—north-west—or south-west; and thus swept the miasma, which was generated along the oozy borders of the Schuylkill, in an eastern direction.

Violent storms, and copious showers of rain, tend powerfully to free the atmosphere from *koino-miasmata*. The former violently disperses them, and the latter sweeps or washes them down to the surface of the earth. Nothing is more common than

to find miasmatic epidemics to remit immediately after copious floods of rain or violent storms, (Rush, Bancroft, Monfalcon.)

A humid air is a much better vehicle for the transportation of miasmatic exhalations, than a dry one. The particles of the miasmatic poison attach themselves to the humidity of the air, and are thereby carried along by currents of wind. It is to be remarked, however, that, although atmospheric humidity appears to favour the dissemination and action of miasmata, yet observation would seem to show that when these effluvia pass over a surface of water, they become absorbed, or in some way lost. This circumstance may, in part, account for the short distance assigned by Bancroft to the dissemination of miasmata from their source; for in all the examples which he adduces in support of this opinion, the miasmata were conveyed over bodies of water.

II. *Idio-Miasmata.*—This variety of miasmata is generated by the decomposition of the matter of perspiration, and the other excretions of the animal body; and hence it most frequently occurs in the confined and crowded hovels of the poor, in crowded jails, ships, hospitals, and wherever many individuals are confined in apartments not duly ventilated. From an inability to procure separate dwellings, the poor are generally obliged to take up with small apartments, into which two or three families are often crowded; and in order to save fuel, and indeed frequently from the total want of fuel, every access of the external cold air is carefully cut off. Add to this the filth and want of proper changes of clothing, almost inseparable from extreme poverty, and you have a combination of circumstances peculiarly calculated to generate a miasma, by the putrefactive decomposition of the animal exhalations with which the air and every article of clothing in such apartments must be saturated. It is chiefly during the *cold season of winter* that this variety of miasmata is generated. When the weather is warm, the air of crowded and filthy apartments is constantly renewed by the doors and windows being kept open, and the accumulation and stagnation of the animal exhalations thereby prevented. Dr. Smith observes, that this miasm is especially apt to be generated in the apartments of the sick, particularly "of those who are labouring under the typhus state of fever."* It may be observed, however, that the exhalations which emanate from the body in a *state of disease*, and which possess the power of producing the same disease as that, under whose influence they are evolved, cannot, with strict propriety, be ranked with the present class of miasmal poisons. They belong to the *contagions*. I would restrict the term *idio-miasma*, to those morbific *effluvia*, which

* Elements of the Etiology and Philosophy of Epidemics, p. 52.

are generated by the *decomposition* of the animal secretions, whether formed in a state of health or disease, and to the ordinary exhalations from the body, when accumulated in such a manner as to deteriorate the atmosphere of confined rooms, if these be really capable in themselves, and without decomposition, of exciting fevers.

Idio-miasmata are always quite limited in the sphere of their influence. Beyond the room or habitation in which they are generated their operation cannot extend; unless, indeed, they are absorbed or adhere to articles of clothing, and are conveyed abroad in a state of sufficient activity to act on the human system. Whenever fever is found to spread from a source of idio-miasmata, it is in consequence, doubtless, of the generation of a new contagious miasm by the disease, which is produced in the first instance by the idio-miasmatic poison. I am well aware that this opinion involves, what has been declared, a manifest inconsistency —namely, the origination of a *contagious* disease by a *common* or general exciting cause. All such objections, founded merely on speculative inferences, may be met by *facts*, which *must stand good*, however irreconcilable they may appear to be with the dogmas of philosophy, or with admitted principles. It is a *fact*, for instance, that typhus may be originated by the miasm resulting from the decomposition of the secretions or exhalations of even healthy individuals, crowded and confined a long time in narrow and unventilated apartments. And, that although not necessarily a contagious malady, typhus may, under peculiar circumstances, generate a specific virus which is capable of exciting the same disease in others, is a fact supported by a mass of testimony which cannot be, reasonably, rejected. "There are few physicians," says one of the most eminent medical writers of the present day,* "who believe that epidemic or endemic fevers *arise* from specific contagion, though facts daily teach us that typhus, yellow-fever, dysentery, &c. occasionally, and under particular circumstances, *give out* a something, (call it what you please) which produces a similar disease in the healthy standerby, who happens to come within its range. If we may venture to prognosticate, we would anticipate that this *will be*, as it assuredly *now is*, the more general opinion among *practitioners*."

From the circumstance of this variety of miasmatic poison "becoming innoxious when diffused in the atmosphere, even a few feet beyond the apartments in which it is generated," none of the forms of disease, which it is capable of producing, are apt to occur epidemically. Typhus, nevertheless, has been known

* Dr. James Johnson, Med. Chir. Rev. vol. VII. (1825,) p. 65.

to occur in a manner well entitled to the name of epidemic. The late widely spread epidemic of Ireland was surely strongly characterized in its progress and extent of diffusion by every feature which can give to diseases the character of an *epidemic*. Though engendered and nursed in the lap of wretchedness and poverty, it did not, in its desolating sway, fall exclusively upon those who were suffering under the distressing privations of penury. Its fatal visitations were abundantly made to the ample and airy habitations of plenty and comfort, and almost—

> ——— æquo pulsat pede pauperum tabernas
> Regumque turres.

The question here occurs: If "idio-miasmata becomes innoxious by being diffused in the atmosphere even a few feet beyond the apartments in which it is engendered," how can typhus, which is manifestly originated by this effluvium, become epidemic, or be produced in large and well ventilated dwellings remote from the usual sources of this miasm? Is it by the idio-miasmata attaching itself to the clothes of individuals, or to other substances by which it may be conveyed from one to another place? If this be admitted, then *idio-miasma* must possess the character of a contagion. Is it not more probable, that in the majority of instances of this kind, the disease is propagated by a specific virus, generated by morbid secretion, and conveyed as other contagions of an aeriform character are conveyed. It does not seem probable that idio-miasmata can be disseminated by fomites. If it can be so disseminated, it must possess all the characteristics of a veritable contagion.

Of the relations of Miasmata to the Animal System, &c.

Having given an account of the physical character and conditions under which the two infectious effluvia, *koino* and *idio-miasmata*, are evolved, I proceed to the consideration of their relations, as morbific agents, with the human system, as well as with each other. Upon this subject I stand largely indebted to the ingenious and truly philosophical work of Professor Smith, of New-York; for although I have long since entertained similar views in relation to the combined agency of these miasmal poisons in the production of fevers, yet the enlarged, systematic, and precise views taken of this subject by Dr. Smith, have afforded me some new and interesting insights into this part of the etiology of fevers.

The class of fevers arising from Koino-miasmata are very distinct in their general character, and we may presume, in their essential natures, from those which are the result of *idio-miasmata*. The former give rise to intermittent remittent and bilious

fevers; and the latter miasm is the source of *typhus*, and the *low nervous fevers* of former writers.

The deleterious power of *koino-miasmata* is manifested not only by the violent and fatal fevers which they are known to produce so abundantly, but also by the more slow inroads they make on the physical and moral condition of those unfortunate beings, who are habitually exposed to their influence. The indigenous inhabitants of marshy districts, in warm climates, present an aspect of suffering and wretchedness from this cause, which is well calculated to draw forth the commiseration of those who are more fortunately located. Continually exposed to the deleterious influence of these baneful exhalations, man, in such situations, exhibits a state of feebleness and early decrepitude, strongly indicative of a broken down constitution, and deep, irremediable chronic disease. So deep and pervading, indeed, are the effects of malaria on the human system, that it never fails to debase, in a remarkable manner, both the physical and moral constitution of a people, who through successive generations, reside in situations abundant in perennial sources of miasmata. Not only does the stature and symmetry of the body suffer conspicuous deterioration, but the mind becomes torpid, feeble, pusillanimous, and the moral sentiments debased.

But while such chronic and constitutional effects are wrought by the habitual endurance of *koino-miasmata*, the system loses its susceptibility of being excited into those violent commotions of febrile action, which this agent is so apt to produce in individuals less accustomed to its impressions. The natives of marshy districts are comparatively much more rarely affected with the higher grades of miasmal fevers, than those who are only occasionally brought within the sphere of its influence. In the former the agency of this poison proceeds as it were by a slow and concealed combustion, whilst in those who are not accustomed to its influence, its effects burst out in a raging and rapidly consuming flame.

There can be but little doubt that *koino-miasmata* varies in its powers, and often very considerably, according to various circumstances, in point of locality and the relative proportions of the animal and vegetable matter which supply the materials for its composition. Dr. James Johnson, whose authority I am always disposed to respect, has expressed his belief in the occurrence of such diversities in the peculiar morbific powers of this agent. "The fever of Batavia," he observes, "differs from the fever of Walcheren—the fever of Antigua, from the fevers of the Ganges—and all these differ materially from the plague of the Levant." That certain countries and localities have an especial tendency "to generate one mode or variety of fever; while in other situations, some other variety as exclusively prevails," is

an observation founded on abundant testimony of unquestionable authority. In Germany, intermittents almost universally assume the tertian type; in Italy, the quotidian type greatly predominates; and in Hungary, paludal fevers are peculiarly apt to be attended with petechiæ. "The fevers of the Pontine marshes are noted for the shortness of their intermissions; whilst Holland is not less remarkable for the variety of the types than the slow progress of the fevers. In Spain, as in Africa, the West Indies, and the southern parts of the United States, the black vomit and the yellowness of the skin are similarly characteristic symptoms."* Even in localities situated within a short distance from each other, the most remarkable difference occurs in the character of the fevers which they engender. Thus, "the fevers of Walcheren," says Dr. Macculloch "differ materially from those of Bresken on the opposite shore of the Scheldt; and in France those of Rochefort differ as completely from those of the Lyonnais."

It cannot be presumed that the relative proportions of animal and vegetable matter should be the same in different localities, and equally improbable is it that the same *kinds* of these materials should be present in the different situations where miasmata are generated. There must be great diversity in both these respects, and a corresponding diversity in the essential morbific qualities of the miasmata evolved from them. I have already mentioned the experiments of Majendie in relation to the effects of putrid animal substances on the animal system. From these it appears, that "different *kinds* of flesh, when in a putrid state, produce different effects on the animal economy,"† and it is, therefore, reasonable to conclude that miasmata will differ in their powers according to the greater or less *proportion* and *kinds* of the animal and vegetable matters concerned in their production.

The influence of *koino-miasmata* on the human system, like that of other general causes of disease, is much under the control of the physiological state of the animal economy, of idiosyncracy, of temperament, predisposition, and of accidental external causes. Thus of a number of individuals exposed for a certain time to the same *miasm*, some may become affected with intermitting fever, others, with mild remittent fever, some with malignant bilious fever, some with bilious colic, some with dysentery, and others perhaps will escape the disease entirely.

The influence of high atmospheric temperature in predisposing the system to the deleterious impressions of miasmata is, probably, very considerable. Long-continued exposure to solar heat appears to have an especial tendency to affect the biliary organs,

* An Essay on Malaria, &c. by John Macculloch, M. D.
† Journal de Physiologie, Janvier, 1823.

and to render the system generally, irritable. These conditions, it may be presumed, are peculiarly favourable to the morbific influence of malaria; and it is not improbable that they sometimes contribute, in a considerable degree, to render the miasmatic fevers of intertropical or hot climates, so peculiarly violent and dangerous. Dr. Macculloch dwells much on "errors of diet" as a predisposing cause of the miasmal fevers. It would appear, that the free use of animal food, in tropical climates, is peculiarly calculated to favour the morbific influence of miasmata; and this is said to be especially the case when the animal food is taken "in the middle of the day, or frequently in one day." On examining Niebuhr's narrative, says Dr. Macculloch "it is most apparent that the deaths of his companions were the consequences of gross feeding." "On this question," says the same writer, "there can perhaps be no better evidence than the opinions and practices of the intertropical nations themselves, among the mass of whom this subject seems well understood; while in many countries it is a caution actually often given to Europeans by the natives, though most generally neglected by them. It is, probably, from long experience, in some measure, of its advantages, as well as from more obvious causes, that a vegetable diet is so general throughout the aborigines of the torrid climates; while it is doubtless from principle, also, that, among the people of Africa, to the northward at least, the sole or the principal meal is supper."

The class of diseases produced by koino-miasmata, if we take into view their various modifications, is by no means limited in its range. The most simple form of disease arising from this cause is the intermittent fever. In proportion as this febrific effluvium increases in potency, so does it produce fevers of a higher and more violent grade. The range of activity of this miasma extends from the simple tertian of the temperate latitudes to the malignant and fatal plague of the east, or the scarcely less fatal bilious fever of Batavia.

Besides general fevers—assuming an endless diversity of character in different seasons and climates, koino-miasmata produce also, various other affections, both local and general. Dysentery, cholera, and diarrhœa, are enumerated among the maladies produced by malaria. It may be doubted, however, whether miasmata, by itself, without the co-operation of other causes, has any particular tendency to excite these affections. I apprehend, that in many instances occurring in malarious districts, as elsewhere, atmospheric vicissitudes, or cold, exerts no small degree of influence in determining the disease upon the alimentary canal. During the autumn of 1814, one fourth, perhaps, of the men of four regiments encamped near Baltimore, were affected with intermitting and remitting fever in the month of Septem-

ber. The weather was remarkably warm, equable and dry. The months of October and November, however, were rainy, extremely variable in temperature, and the majority of the men, who were previously lodged in covered rope-walks and houses, were now encamped in tents. A week after the rainy and cold weather set in, dysentery and diarrhœa began to appear abundantly, and in the course of three weeks more, there were but very few cases of intermitting or remitting fever, but more than eight hundred cases of dysentery. Nevertheless, the capability of miasmata of producing these forms of intestinal disease by its own unaided powers, is not to be questioned, although it is, I think, equally evident, that the co-operation of sudden changes of atmospheric temperature, or cold, is especially calculated to enhance the tendency of the miasmata to occasion these diseases. From these remarks, cholera ought to be excepted, for the cholera of India, at least, is most undoutedly the product of a miasmatic agent.

Dr. Macculloch mentions tic douloureux as a common consequence of the influence of miasmata,—more especially in Italy; and the occurrence of periodical hemicrania from this cause, is by no means unfrequent, even in our own climates. In truth, there is scarcely a malady that may not be produced or simulated by the operation of malaria on the human system.

The period which intervenes between the reception of koino-miasmata and the first manifestation of its influence on the human body, is extremely various. Of many persons exposed to it at the same time, some may be immediately affected, others in a few days, some not until several weeks have passed, whilst others may remain free from its effects a still longer time.

As the powers of *koino-miasmata* most probably vary considerably in different countries and localities, it may be inferred, as has already been observed, that the fevers which they produce are impressed with a corresponding diversity in their character; and observation would seem to confirm this inference. Dr. Smith thinks, that whatever external or general diversities may occur in fevers produced by this miasma, "their pathology or essential nature is every where the same." This is highly probable; for the diversities in question would seem to depend more on the mere grade of violence, local affections, and general course of these fevers, than on any radical difference in their essential pathological conditions. Upon this point, however, it becomes us to speak with diffidence, as this question is not to be solved by mere closet inferences and reasonings, but by close observation and careful experience, in relation to these fevers as they occur in various countries, climates, and localities.

How far a mixture, or the combined agency of *koino* and *idio-miasmata*, may operate in producing novel or anomalous

varieties of fever, it is impossible to say; but that such a combination does sometimes occur, and give rise to fevers of a peculiar or mixed character, will scarcely be doubted by any one who has given due attention to this interesting subject. Professor Smith, to whose work I have already so frequently referred, has given this subject a comprehensive and minute consideration, and to whom, indeed, the credit is due for introducing this interesting point of etiology to the notice of the profession. "Let us suppose," says Dr. Smith, "the circumstances in which typhus originates, to occur in summer, such as the crowding of individuals into small apartments, badly ventilated, and rendered offensive by personal and domestic filth. These causes would obviously produce typhus in its ordinary form. But suppose there exist at the same time, those exhalations which occasion plague and yellow fever, or intermittent and remittent fevers. Under such circumstances, we should not expect to see any one of those diseases fully and distinctly formed, but a disease of a novel or modified character." There exists no doubt in my mind, of the correctness of Dr. Smith's observation, that the late Banker street fever in New-York, as well as the peculiar fever which prevailed among the blacks in this city, a few years ago, was engendered by the united influence of these two miasmal poisons. I once had a striking illustration of the anomalous and fatal character which the united action of *koino* and *idio-miasmata* are apt to impart to fever. During the fall of 1814, while attending in the capacity of regimental surgeon in the encampment at Baltimore, ten men affected with mild remitting fever, were lodged in a room of confined dimensions, and as the weather was cold, the room was kept pretty warm by fire, and the doors and windows as little opened as was admissible. The adjoining room was exceedingly crowded with invalids, and but little attention paid to cleanliness and ventilation. In a short time several cases of fatal typhus occurred in this room. Soon after this, the patients who were affected with intermitting fever in the next room, manifested new and more alarming symptoms; blood began to ooze from their gums; extreme tenderness of the epigastrium occurred; the intellect was but little disturbed; the eyes were dull, watery, and staring; the temperature of the skin and the pulse nearly natural; the animal powers so little prostrated, that one of the men died a few minutes after he had been sitting up with his back leaned against the wall of the room. They were all immediately removed to the Baltimore Hospital, and all except one died in a few days. There can be no doubt, that this peculiar modification of febrile disease was the result of the impressions of *idio-miasmata* (engendered in the house,) made on systems already under the morbific influence of *koino-miasmata*.

Sect. V.—*Of Contagion.*

By a contagion is understood a deleterious agent secreted by the animal body in a state of disease, which when brought to act on a healthy individual, will produce a disease specifically similar to the one from which it derives its origin. Contagions occur under two distinct forms, and may therefore be divided into two varieties: viz. 1. Those which consist of a *palpable matter* or *virus;* and, 2. Those which consist of an *imperceptible effluvium*. The *chronic* contagious maladies are propagated exclusively by a *palpable* virus, and consequently always by actual contact. Those *acute* contagious diseases which are not attended by a specific local affection, or an exantheme, are, on the other hand, exclusively propagated by a morbific contagious *effluvium*, and, by consequence, solely through the medium of the atmosphere. Those *acute* diseases, which *are* essentially connected with a *specific local affection, or an exantheme*, are communicated both by a palpable virus, and by an imperceptible effluvium, and consequently both by actual contact and through the medium of the atmosphere. We perceive, therefore, that of the extremes of a purely *local*, and a purely *general* malady, there is, on the one hand, communication of the disease solely by a *palpable* matter, and, on the other, by *effluvia* only; and that where the *local* and the *general* affections meet in the same disease, as essential concomitants, (in the exanthemata) there the two modes of propagation also obtain.*

It must be observed, however, that though in a practical point of view we may properly adopt these distinctions between contagions communicated by *contact*, and through the *medium of the atmosphere*, yet, in reality, an actual contact must, necessarily, always occur between the contagion and the individual, before it can possibly produce disease, whether the contagion be a palpable matter, or an imperceptible miasm. The only material difference consists in the mode in which this contact is effected.

One of the most remarkable peculiarities of contagious diseases, is their inherent and undeviating tendency to preserve their essential individuality, under whatever circumstances of age, sex, constitution, temperament, modes of living, climate, and place, they may occur. Thus, the small-pox of the present day, differs in no essential circumstance from the same disease,

* This arrangement is adopted from Dr. Hosack's very lucid classification of contagions and their peculiar diseases. There is no writer of the present day, whose views upon the character and arrangement of this class of maladies, deserve higher respect and attention than those which have been promulgated by Dr. Hosack.

as it was observed and described by Rhazes more than eight centuries ago; and the itch has changed in nothing since the time of Galen. Any certain contagion can, so far as we know, produce only one disease; and if the system has become insusceptible of such disease, its peculiar cause is no longer a morbific agent in relation to that system.

The laws of the acute contagious diseases differ entirely from those which govern the rise, progress, and declension of the chronic contagious affections. The former observe the utmost regularity in all these respects. The rise, advancement, and decline, in short, the whole series of essential phenomena, are governed by laws as steadfast as those which regulate the motions of the planets. The latter class of diseases, on the contrary, are extremely irregular in their course, having no definite period of duration, nor established order and duration of the successive phenomena of their course.

The power which the acute contagious diseases have of destroying the susceptibility of the human system, to the subsequent influence of their specific causes, constitutes one of the most remarkable and mysterious characteristics of this class of maladies. In this respect, they differ as far from the *chronic* affections of this kind, as they do from the febrile diseases produced by general or non-contagious causes. In consequence of this law of *acute* contagious diseases, no malady of this kind can ever relapse during the period of convalescence.

Considerable diversity of sentiment has been expressed in relation to the distance to which contagious miasmata may be dispersed from their source, in a state of sufficient activity to generate disease. That their sphere of activity is very limited, however, has been abundantly demonstrated, both by direct experiment and observation. The experiments of Dr. O. Ryan, professor of physic in the college of Lyons, prove that the contagious miasm of small-pox does not extend more than a few feet beyond its source.* The most malignant contagions are rendered inert and harmless by being diffused in the atmosphere, and even by diffusion in the air of a well ventilated apartment. Ventilation diminishes the activity of contagious effluvia, simply by diffusing the miasm in a large portion of atmospheric air, in consequence of which, those who become exposed to it, receive it in weak and inefficient doses.

Contagions are perpetuated and conveyed to great distances from their source, by being absorbed by, and attached to, various substances, such as clothing, furniture, bedding, &c., with which they are often transported even across the ocean. Animal substances, such as wool, hair, and articles manufactured

* Rees's Cyclopedia, article Contagion.

from them, are said to retain contagious matter with the greatest tenacity. The more the substances which have become saturated with contagion are kept from the access of the open air, the more virulent and active will be its powers when it is brought to act upon the human system. Thus, articles of clothing, after having been impregnated with contagious virus, will retain the power of infecting much longer, and in much greater intensity, if they are kept confined in close rooms, or locked up in chests or closets, than when they are freely exposed to the open air. It is by articles of this kind, locked up in trunks, that the small-pox, and other contagious maladies, have been conveyed to distant parts of the world in ships, although no person on board may have been sick with the disease during the voyage. The articles which are thus imbued with contagious virus, are called *fomites*. It was the opinion of Cullen, that contagions are more powerful when they are thus lodged in fomites, than when they arise immediately from the human body, or when in a separate state. The same opinion is expressed by Dr. Lind.

The influence which peculiar atmospheric constitutions have on the activity of contagions, and on their tendency to dissemination, is a subject as interesting as it is inscrutable. The most careless observation is sufficient to convince any one, that there exists in the varying constitutional, or perhaps accidental conditions of the atmosphere, a powerful modifying principle in relation to the powers of contagious agents. At times, it would seem impossible for a contagious disease to extend the sphere of its ravages; for, although sporadic cases may occur here and there, yet no neglect in relation to proper seclusion, will enable the disease to assume an epidemic or endemic character. During other periods, on the contrary, the accidental importation of *fomites*, or the occurrence of a case of contagious disease, acts like a spark of fire thrown among combustible materials, and speedily spreads disease extensively among the people. The same powerful atmospheric influence shows itself in the diversity of character, in relation to the grade of violence, malignity, and general diathesis, which the same malady is observed to assume at different periods of its prevalence. That these things depend on some modifying agency of the atmosphere, there can exist but little doubt. What this condition of the atmosphere consists in, it seems impossible to ascertain; it is probable, however, that it has no immediate connexion with either the temperature or the hygrometrical state of the air; for, with the exception of typhus, which is manifestly favoured by cold weather, the contagious diseases of every kind prevail equally during the heat of the summer and the cold of the winter. The mode in which contagions are either favoured or retarded in their progress by atmospheric constitutions, consists, probably, not in

any influence which they may exert immediately on the powers of the contagion, but rather, perhaps, in their tendency to modify the human constitution, so as at one time to render it peculiarly susceptible of the influence of the contagion, and at another to diminish, or for a time to annul, the natural predisposition to its operation.

Of the primary source of contagion we know but very little. It is probable that each contagious disease was at first developed, independent of contagion, by the accidental concurrence of various circumstances, which, in the infinite series of such contingencies, may not again occur for many centuries. That a disease may be originated by the concurrence of general causes, without the agency of a contagion, and which may afterwards communicate itself to others, by a specific virus of its own elaboration, we have a familiar example both in typhus fever and in itch. There is reason to believe, indeed, that various contagions have been thus produced, which have long since passed away from the face of the earth ;* and it is not an idle conjecture to say, that new contagions may hereafter arise, which, after having exhausted their power on mankind, may again disappear for ever, or until a similar concurrence of causes, which at first evolved the contagion, again occurs.

It is an interesting fact, that contagious diseases sometimes originate in the lower orders of animals, and are afterwards communicated to the human species. Hydrophobia and the vaccine disease are familiar examples of this kind. Professor Remur has published some observations which go to show that other diseases, such as the virulent coryza of horses, the plica of long-haired animals, and the gangrenous inflammation of the spleen which occurs in cows, may be communicated by immediate contact to man.

The following rules have been recommended for preventing the spread of contagious maladies to those who are obliged to approach patients labouring under diseases of this kind (Haygarth.)

1. "The chamber in which the patient lies, must be kept *clean and freely ventilated.* No bed curtains must be allowed to be drawn around the patient."
2. "Dirty clothes, utensils, &c. should be often changed, and immediately immersed in cold water ; and washed clean when taken out."

* The *sudor anglicanus*, so accurately described by *Caius*, appears to have been a highly contagious disease. It visited England five times in the period of seven years, and swept off a vast number of victims by its fatal violence. In many instances, those who were affected with it died within an hour, and few who sunk under its malignity suffered longer than four or five hours. It has not been known to occur for several centuries past, its contagion having long since become wholly extinct.

3. "The discharges from the patient must be instantly removed; and the floor around the patient should be rubbed clean once a day with a wet cloth."
4. "Avoid the current of the patient's breath, as well as the effluvia which ascend from his body, and from the evacuations."
5. "Visitors ought not to go into the patient's chamber with an empty stomach; and in doubtful circumstances, on coming out they should blow from the nose and spit from the mouth any contagious poison which may adhere to these passages."

Although it is quite certain that contagions will adhere to and imbue various substances, especially clothing, so as afterwards to reproduce the same disease, at a distance from their source, and often a long time after they had been generated; yet it seems to be well ascertained, that such substances, (clothing) can rarely be so greatly imbued with contagion by a slight and transient exposure to the poison, as to be capable, afterwards, of producing disease in the healthy. The clothes of transient visitors, for instance, will scarcely ever imbibe sufficient contagion to communicate the disease to others. "Dr. Clark affirms, that in eighteen years of medical practice, he never communicated the contagion of small-pox nor of scarlet fever to any one, although he had frequently, on the same day, visited many patients sick with these diseases, and in their most malignant forms."

Mere ventilation is inadequate to destroy the contagion deposited in fomites. To effect this important object, a great variety of means, such as exposing them to various vapours and fumes, have been devised. Without enumerating the different disinfecting agents which have been successively brought forward and again rejected, it will be sufficient to mention those which experience has shown to possess active powers in this respect, and which are now relied on as unquestionable disinfecting agents. *The nitrous acid vapours* have been much employed for disinfecting ships and houses, in which contagion has been found to exist. Such was the evidence brought forward of the efficacy of the nitrous acid fumes in purifying infected places and fomites, that the British parliament voted a national donation of five thousand pounds to Dr. Carmichael Smith for the discovery. This vapour is readily obtained by mixing with powdered nitre, in a cup, a little of sulphuric acid, and applying gentle heat with a lamp.

At present however, chlorine, and the chlorides of lime and soda, are regarded as decidedly the best disinfecting agents we possess. M. Labarraque's *disinfecting soda liquid* is a compound of soda and chlorine, and its efficacy in destroying infec-

tious matter, has been conclusively demonstrated. "It is now much used in removing the offensive odour arising from drains, sewers or all kinds of animal matter in a state of putrefaction. Bodies disinterred for the purpose of judicial inquiry, or parts of the body advanced in putrefaction, may, by its means, be rendered fit for examination; and it is employed in surgical practice for destroying the fetor of malignant ulcers. Clothes worn by persons during pestilential diseases, are disinfected by being washed with this compound. It is also used in fumigating the chambers of the sick, for the disengagement of the chlorine is so gradual, that it does not prove injurious or annoying to the patient. In all these instances chlorine appears actually to decompose the noxious exhalations by uniting with the elements of which they consist, and especially with hydrogen."

"Pure chloride of soda is easily prepared by transmitting to saturation a current of chlorine gas into a cold and rather dilute solution of caustic soda. In preparing the disinfecting liquid of Labarraque, it is necessary to be exact in the proportion of the ingredients employed. The quantity used by Mr. Faraday, founded on the directions of Labarraque, are as follows: Dissolve 2800 grains of crystallized carbonate of soda in 1.28 pints of water, and through the solution contained in a Wolf's apparatus, transmit the chlorine evolved from a mixture of 967 grains of sea-salt and 750 grains of peroxide of manganese when acted on by 967 grains of sulphuric acid diluted with 750 grains of water."*

CHAPTER III.

OF THE GENERAL COURSE, TYPE, AND STAGES OF FEVER.

The series of phenomena which intervene between the commencement of a fever, and its termination in convalescence, constitutes what is technically called its *course*. The course of a fever is either *intermitting*, *remitting*, or *continued*, according as its phenomena intermit, or remit, or are continuous.

The series of phenomena which constitute the course of a fever, may be divided into *six* periods or stages; viz. the *forming*, the *cold*, the *hot*, the *critical*, the *declining*, and the *convalescing* periods.

It should be observed, however, that these stages are not always

* Turner's Elements of Chemistry.

distinctly marked, in violent and continuous forms of fever, although very few fevers occur in which the primary stage of oppression, the stage of excitement, and the period of declension, may not be distinctly observed. The febrile paroxysm of an intermitting fever offers the most distinct exemplification of the successive changes or stages which occur in the course of a fever.

1. The *forming* stage—the *stadium prodromorum*, includes the period which intervenes between the first impressions of the febrific cause, and the actual commencement of the febrile phenomena. This period is characterized by a variety of feelings or sensations, which, though manifesting a deviation from the healthy condition of the system, do not constitute any definite state of disease. These constitute the *premonitory* symptoms. Their duration is very various; and in some instances, though very rarely, they are entirely absent—the disease making its attack at once, without any previous manifestations of its approach. This is most apt to occur in fevers of very vigorous reaction, and in such as are of a malignant character. The longer or shorter duration of the premonitory stage depends, however, probably as much on the different powers of vital resistance, as on a difference in the degree of concentration or activity of the remote febrific cause. The whole train of premonitory symptoms may be regarded as the result of the struggle between the vital powers and the febrific cause. If the cause be feeble, and the vital resistance great, its first impressions may give rise to some unusual or unpleasant sensations, until the system finally triumphs over its influence, and disease be obviated. When the relative powers of the cause and the vital resistance are more nearly balanced, the struggle between them may be prolonged, until the latter yield and disease be developed; and where the system resists feebly, whilst the febrific cause acts with energy, the contest will probably be short, and the fever occur suddenly, with violent symptoms. There exists, nevertheless, in almost every febrific cause, a natural tendency to produce some peculiar premonitory symptoms, although the general and most conspicuous of these phenomena are pretty nearly the same in almost every form of febrile disease. In general, those fevers which are apt to run through a protracted course, have a much longer train of premonitory symptoms than such as are violent and of short duration. Thus, the premonitory period is almost uniformly much more protracted in typhus and typhoid, than in the synocal fevers.

The following are among the most common symptoms of this initial period of febrile affections: loss of appetite; disturbed sleep; yawning, stretching, lassitude, wandering pains in the limbs and back; an unpleasant sensation in the stomach; a harsh and dry skin; irregularity of the bowels; a general feeling of

mal-aise; nausea; eructations; interruptions of the ordinary habits and appetites; fretfulness; discontent; slight headach; slight creeping sensations of cold; the drying up of old sores; tremors of the extremities; changed expression of the countenance; giddiness; and perhaps some other slight deviations from a state of perfect health, or the ordinary habits and feelings of the individual.

If we examine the symptoms of this stage in the usual order in which they occur, we will perceive that the nervous system is the first that suffers; this is manifested by the lassitude, languor, and slight transient pains which usher in this stage. Next, the digestive organs are brought into a state of slight suffering; and finally the skin. The heart and arteries appear to be the last organs which are brought into morbid action in the development of fever.

2. The *cold stage.*—Nearly all fevers commence with more or less sensation of chilliness. The feeling of cold is not always attended with an actual subduction of sensible temperature. In some instances, the skin of the patient feels warm to the touch, whilst he is shivering under the severest sensations of cold. It is manifest, therefore, that in such cases, the feeling of cold depends in reality on an altered or morbid condition of the sensibility of the skin, in consequence of which its power of *perceiving* (if I may use the expression) the ordinary degree of animal temperature is diminished. In most instances of febrile chills, however, there occurs an actual reduction of the temperature of the surface, especially of the hands and feet. Not unfrequently these parts feel quite cold to the touch of a healthy person, whilst the surface of the trunk and the forehead are of the natural temperature, and sometimes apparently even higher; although the sensation of chilliness experienced by the patient will be diffused throughout his whole system. The chills are attended with a pale, contracted, and dry state of the surface; the volume of the body is diminished; the respiration confined, irregular, anxious, and oppressed, attended frequently with a short dry cough; the head feels confused; the tongue is dry, attended sometimes with great thirst; the pulse becomes extremely small, frequent, and feeble; nausea often occurs, and sometimes vomiting. The sense of chilliness is usually diffused over the whole body; though in some instances, it is partial, and occasionally, limited to a small part of the body. In general, the more violent the chills are, the more vigorous will be the subsequent arterial reaction. As the cold stage gradually subsides, the arterial reaction regularly rises, until chilliness has wholly gone off, and the disease has entered into the—

3. Third, or *hot stage.*—This stage is characterized by what may be termed the essential phenomena of fever: viz. augmented

heat, and a return of the natural fulness and colour of the surface; flushed countenance; a full, quick, frequent, and vigorous, or a small, tense, quick, and frequent pulse; throbbing pain in the head; eyes prominent and sensible to the light; a dry and hot skin; urine scanty and high-coloured; continued wakefulness, &c. These symptoms, with more or less intensity, continue for a longer or shorter period, until the *acme* of the febrile condition has arrived and the period of—

4. *Crisis supervenes.* By crisis, is understood, in the most general acceptation of the term, that period in the course of a fever at which it has arrived at its highest point, and a determination either to a fatal or a favourable issue takes place; and by which therefore the fate of the patient is determined. The period during which this decision occurs, is necessarily always short; and is almost universally attended with some *evacuation.* The most common critical evacuation of a simple febrile paroxysm, consists of a very greatly increased flow of *perspiration,* and hence the subsequent period during which this evacuation is continued, is called the *sweating stage,* but which I would call—

5. *The stage of declension—stadium decrementi morbi.*— This stage may be considered as commencing immediately after the favourable crisis has taken place. In the rapid, continued fevers, and in a single paroxysm of an *intermittent,* one crisis only occurs; but in by far the greater number of protracted, and especially in *remitting* fevers, the crises continue to recur through the whole period of declension at every tertian exacerbation, until the disease is finally subdued. The duration of this stage is extremely various. In general, the period of declension will be pretty nearly in proportion to the period occupied in the progress of the fever to its acme.

The space of time which is occupied by one paroxysm of a fever and its succeeding intermission, or which intervenes between the regular periodical exacerbations of fevers not paroxysmal, is called the *revolution* of a fever. The *revolutions* of fevers are various in point of duration; some fevers completing theirs in 24 hours, others in 48, whilst others require 72 and some even 96 hours. The form which a fever assumes, in this respect, is called its *type;* so that a fever which occupies 24 hours from the commencement of one paroxysm to another, is said to be of the *quotidian* type; whilst one which revolves every 48 hours, is of the *tertian* type; and when this period is extended to 72 hours, the fever is of the *quartan* type, and a period of 96 hours, constitutes the *quintan* type. The *quotidian,* the *tertian,* and the *quartan* types, constitute the three principal and primary types of fevers; all of which are, however, subject to modifications, which may readily mislead the careless

observer, so as to confound them, or mistake one for the other, especially the quotidian and the tertian.

It has been observed, that in fevers of the *quotidian* type, the paroxysms generally come on in the *morning*—a circumstance which has been almost invariably verified in my own experience, and which is indeed so constant, that Cullen was induced to notice it in his definition of a *quotidian*. *Tertians* commonly come on towards noon; but they are much less regular, in this respect, than fevers of the preceding type. *Two* simple tertians sometimes go on contemporaneously, in the same patient; so that, instead of the paroxysms recurring only every other day, they occur daily, as in a quotidian. These cases are called *double tertians*, and are distinguished from quotidians, by the paroxysms of the alternate days being similar in relation to the precise time of their occurrence, grade of violence, duration, and other circumstances. Thus the paroxysms on the *odd* days will perhaps recur at 9 o'clock in the forenoon, whilst those which happen on the *even* days will come on at 2 or 3 o'clock in the afternoon, so that, although each day has its paroxysm, the fever cannot be properly considered as a quotidian, but the contemporaneous progress of two simple tertians, the one having commenced a day sooner than the other. Fevers, however, rarely assume the double tertian type from their commencement. They usually begin and continue for some time, in the simple tertian type—the duplication occurring afterwards; and when the type thus becomes doubled, the new or accessory paroxysms are generally considerably milder than those of the original or simple tertian. It is asserted, that a double tertian seldom terminates without first assuming the single tertian type—the accessory or weaker paroxysm disappearing first.*

There are other varieties of double tertians, mentioned by the older writers, such as the *tertiana duplicata*, in which two paroxysms occur every *second* day, and none on the intervening one; the *hæmitritæus* of the ancients, in which a paroxysm occurs daily, the intermissions or remissions between the first and second, the third and fourth, being much more prolonged than those which occur between the second and third, the fourth and fifth, &c. Authors also mention a *triple tertian*—tertiana triplex.

The quartan type, also, has been known to assume similar modifications. *Double* and *triple* quartans are mentioned in the books; as well as other anomalous varieties of this affection.

Before I proceed to the consideration of the particular forms of fever, it will be proper to say something concerning *crisis* or *critical days*—a subject which, though but little regarded at

* Richter's Specielle Therapie. Vol. I.

the present day, appears to me entirely worthy of attention. It may, I think, be assumed as a safe principle, that doctrines or sentiments, concerning facts which are objects of mere observation and experience, cannot be wholly erroneous or illusory, after having obtained the entire confidence, through a series of more than twenty centuries, of a vast number of as accurate and devoted observers of nature as have ever adorned our profession. Without professing a belief in the correctness of the doctrine of crisis, as it was taught by the ancients, and by many of the moderns, we may yet admit, on good grounds, it is conceived, that there exists a natural tendency in the operations of the animal economy, whether in a state of health or disease, to certain periodical fluctuations, which, under particular circumstances, manifest themselves in a way sufficiently conspicuous to exhibit an obvious revolution in the increase and declension of the morbid actions of the animal system. It was early observed, that there are certain regular periods in the course of many febrile affections, at which prominent changes are wont to occur, preceded generally by a manifest aggravation of the symptoms, and followed or attended by certain evacuations. These evacuations, from their being almost always followed by an obvious abatement in the symptoms, were called critical, and were thought to consist of noxious or febrific matters, thus thrust out of the system by the sanative powers of nature. Fever was supposed to be nothing else than an effort of nature, to prepare and cast out of the system the morbific materials which disturbed the regular actions of the animal economy, and that the amendment which ensued was the immediate consequence of such eliminations of morbific matter. At the present day it is, however, more correctly maintained that these critical discharges are the effects, and not the causes of the melioration which occurs about the periods at which they take place; and that they are to be viewed, rather as the first manifestations of a favourable change in the condition of the system, than as the immediate causes of such a change. That this is the correct view in relation to the nature of such discharges, there can, indeed, exist no doubt; but this view of the subject does not deprive it of its importance, and directs our attention rather to the periodical exacerbations and inherent tendencies in these maladies to terminate their course, at one period in preference to another, than, merely, to the evacuations which are apt to supervene at such times. In no forms of fever, perhaps, are these tendencies to terminate at a certain fixed period, more frequently manifested than in intermittents. There appears, in these fevers, a tendency to a septenary revolution, which I have often seen verified in the most unequivocal manner. If an ague of the quotidian type be suffered to run on, until it terminates spontaneously, the termination

will almost universally occur, if it occur at all, either after the seventh, fourteenth, or twenty-first paroxysms; and I have repeatedly found, that febrifuge remedies, exhibited immediately after these septenary periods, will arrest it with more certainty, and with much less liability to relapse, than when employed during any of the intervening intermissions. From the same inherent tendency, the relapses which are so common in this disease, will, in a vast majority of instances, occur about the septenary periods from the time of the last paroxysm, and most commonly about the eighth or fourteenth, and sometimes for several periods about the twentieth day—(*Jackson*,* *Sprengle*.†)

Observation has shown, that the crises of fevers happen almost uniformly on the odd days, reckoning from the commencement of the malady. According to the observations of Hippocrates, the crises occur in conformity to the *tertian* type, until the fifth crisis, or the eleventh day of the fever, after which they observe the quartan type, occurring only every fourth day. It must be observed, however, that these evacuations do not occur exclusively on the days just indicated, for they are sometimes, though rarely, found to happen on the intervening days. Galen supposed, that when the crisis falls on any other than a critical day, the fever has been diverted from its natural tendency by the accidental occurrence of irritation in some part of the system. Galen divided the critical days into the *perfect*, the *secondary*, and the *intercurrent*. The *perfect* are those which happen on the seventh, fourteenth, twenty-first, and twenty-eighth days. The secondary, or less perfect, occur on the intermediate day between each perfect or septenary crisis; namely, the fourth, eleventh, eighteenth, twenty-fifth, &c. days. If, for example, it was observed that a slight deposit in the urine, or a moderate flow of sweat took place on the eleventh day, it was regarded as an indication of a more perfect crisis on the fourteenth day. The intercurrent crises occur on the remaining odd days—that is, on the fifth, ninth, thirteenth, &c. Such are the principal points in the doctrine of *crisis*, as it was taught by the ancients, and more especially by Hippocrates, and his commentator Galen. No one at the present day, however, pretends to have observed the many minute distinctions and phenomena, which are embraced in the ancient doctrine on this subject; indeed, there are very few who regard it as at all worth *any* attention; and the profession seem long since to have thrown it into the common mass of error and misconception, which has been formed out of the wrecks of former systems and doctrines. However antiquated it may appear, at the present advanced stage of

* On the diseases of Jamaica.

† Handbuch der Pathologie, Band. II. p. 171.

our science, to profess some faith in the general correctness of this doctrine, I cannot, at the risk even of being set down as a cherisher of obsolete and exploded sentiments, divest myself of the conviction, that among much that is erroneous and absurd in this doctrine, there are important and fundamental truths, which ought not to be carelessly rejected.

In order to understand the nature of crisis, every fever must be considered as having a tendency to some one of the principal *types*, mentioned above. A simple tertian intermittent, may be regarded as the elementary type of fever. In fevers of this type, an exacerbation or paroxysm, and a crisis, will occur on every odd day; and if we consider a *continued* fever as made up of tertian paroxysms prolonged and running into each other, or as possessing a natural, though countervailed tendency to the elementary or tertian type, there will, in like manner, occur more or less considerable tertian exacerbations, with their accompanying discharges. From what has already been said concerning the manifest septenary movements of intermittents, the tendency of continued fevers to terminate on the fourteenth or twenty-first days, which can scarcely be denied, would seem to be in conformity to an original law of the animal economy, under a state of febrile excitement.

The evacuations which usually accompany the crisis of fever are, 1. hæmorrhages; 2. a flow of sweat; 3. an increase or changed character of urine; and 4. diarrhœa. Critical hæmorrhages are generally attended with an increased action of the heart and arteries, and often with a manifest determination to, and congestion in, the part from which the discharge occurs. They must be regarded as mere manifestations of a previous change in the system, and hence this kind of critical evacuation cannot be substituted by an artificial abstraction of blood; since, although blood may be abstracted, the peculiar action of the solids, which constitutes the actual crisis or change to a favourable tendency, cannot be thus produced. Crisis, by hæmorrhage, is generally confined to inflammatory fever; or, more correctly speaking, to fevers attended with an increased activity and action of the heart and arteries. Critical hæmorrhages most commonly proceed from the nose, and, according to the observations of many of the older writers, are frequently preceded by the *dicrotus* pulse, in which two distinct wave-like beats occur during each dyastole of the artery. Immediately before the irruption of the blood the carotids beat strongly, the face becomes flushed, sparks appear before the eyes, the eyes are red and suffused with tears; and, in some instances, frequent sneezing, and a thin watery discharge from the nostrils occurs just before the hæmorrhage appears. Critical sanguineous discharges have also been known to occur from the uterus, the rectum, and some-

times, though very rarely, from the stomach, and even from external parts.

Crisis, by an increased flow of *perspiration*, is by no means uncommon. Catarrhal and rheumatic fevers are more apt to terminate by this mode of crisis, than any other forms of febrile affection. This discharge is not, however, to be regarded as indicative of a favourable change in the malady, unless it be generally diffused over the whole surface, and especially, unless it be *attended with a turbid state of the urine*, or a copious sediment in this latter evacuation. The surface should, moreover, be soft, and of a natural temperature—that is, not cold and clammy.

Crisis by *urine*, independent of perspiration, is a very uncommon mode of termination in febrile complaints. A critical urine derives its favourable character not so much from the mere *quantity* of the evacuation, as from its *appearances* and the *materials* with which it is impregnated or mixed. For inspection, the urine which is evacuated at the termination of a paroxysm, or in the morning, ought to be chosen. In a truly critical urine there may be seen at first a cloud floating in the upper part of the vessel, then a globular body of mucous about the middle, and a sediment at the bottom.* So universal is the concurrence of a critical urine, and a general moisture of the skin, that these two evacuations may be considered as essentially connected.

A critical discharge from the bowels is less common than those I have already mentioned. It occurs most frequently in bilious fevers, and in such febrile affections as are attended with some visceral disease within the abdomen. These discharges do not, however, occur as the others do, in the acme or exacerbations of the fever, but during the periods of remission. They are generally very copious. The signs of an approaching crisis by diarrhœa, are a peculiar trembling of the under lip; stammering speech; a full and wave-like pulse; pain and rumbling noise in the bowels; discharge of wind; a moist tongue; itching in the nose; paucity of urine, &c. (Richter.)

* Vogel, Richter, Hufeland. I have frequently noticed these appearances in the urine, evacuated after a paroxym of intermitting fever; and I am well satisfied that it is a common occurrence in the urine discharged soon after fevers have commenced to decline.

OF THE ACUTE DISEASES OF THE SANGUIFEROUS SYSTEM.

B. OF GENERAL IRRITATIVE DISEASES OF THE BLOOD VESSELS, INDEPENDENT OF LOCAL INFLAMMATION.

CHAPTER IV.

OF INTERMITTING FEVER.

Intermitting fevers occur under the three primary types mentioned in the preceding chapter, and occasionally under the various complications which these types are liable to assume. According to the type which they assume, therefore, they are divided into *quotidians*, *tertians*, *quartans*, *quintans*, *&c.*

The fit or paroxysm of an intermitting fever consists of *three* distinct *periods*, all of which are characterized by a series of *peculiar* phenomena, each succeeding period being the immediate consequence of the one which precedes it.

The symptoms which characterize the *forming* stage of an intermittent paroxysm, do not differ from those which usually precede the development of other forms of fever. A sense of great lassitude, frequent yawning and stretching, a feeling of uncomfortable weariness of the whole body, and slight aching pains in the loins and extremities, constitute the first manifestations of the approach of an intermittent fever.

Cold stage.—After the foregoing symptoms have continued for an indefinite time, the patient begins to experience slight and transient sensations of cold along the back; attended often with an irresistible disposition to yawn and change the position of the extremities; the fingers and feet lose their natural temperature, and feel slightly benumbed; the patient becomes restless, and soon tired of the same position; his ideas pass with unusual rapidity through his mind, he is incapable of fixing his attention upon any particular object, and generally manifests an unusual irritability of mind, or ill temper, or a taciturn moroseness. The sensation of chilliness, with more or less rapidity, extends itself from the extremities over the whole body; the skin becomes universally pale, contracted, and rough; the pulse loses its activity and size, becoming small, contracted, frequent, and firm.

When the sense of chilliness has passed from the extremities to the body, a slight trembling of the muscles begins, generally, at first, in the jaws, and extending thence quickly over the whole frame. This trembling is sometimes so severe as to agitate the patient as if he were in a paroxysm of convulsions, and sometimes exhausts him so much as to leave him scarcely able to move his limbs after their subsidence. These tremors are technically called *rigors*. During the chills the sensibility of the surface is benumbed, and the whole body becomes diminished in volume, so that rings which were previously tight drop from the fingers. The fecling of cold is not confined to the surface, but appears in violent cases to penetrate even to the bones, and to pervade the whole system, "and is accompanied with an indescribable sense of universal pain and of fatigue."* The breathing also is hurried, anxious, and oppressed, and frequently attended with a short dry cough, deep sighing, and a sense of weight and tightness in the chest. Along with these symptoms there occurs usually much dejection and confusion of the mind, and, in some instances, a slight degree of delirium. In very debilitated persons a violent fit of *rigors* often induces a complete state of stupor or coma, more especially when feebleness of body is attended with general plethora. In many instances, frequent and distressing vomiting occurs, particularly about the period of its subsidence, and the ejections are generally bilious, though occasionally ropy, transparent, and insipid. The thirst is always urgent in this stage, and the mouth and fauces are dry and clammy. The urine is clear, colourless, without sediment, and often copious. Generally, the chills are universally diffused over the body; but in some cases they occur partially, remaining confined to one or more parts of the body; and instances have been recorded, in which a single extremity only was affected with the chills. In some cases of intermitting fever, the cold stage is attended with but a very slight sensation of chilliness creeping along the back and over the extremities; and I have known this stage to commence with violent vomiting, and to terminate speedily in stupor and partial insensibility. The duration of the cold stage is very various, ranging from a few minutes to four or five hours. Sooner or later, however, the chills begin to abate; transient flushes of heat pass over the face and body; the chilliness now recedes rapidly, and the heat encroaches *pari passu*, until it has obtained an entire ascendency. At this time the nausea and vomiting are usually most severe—both of which often continue until the hot stage is completely developed.

The hot stage is characterized by a full and flushed countenance; an intensely *hot* and *dry* state of the surface of the body;

* Macculloch, on Intermittent and Remittent Fever, &c.

great thirst and dryness of the mouth; great acuteness of the sensorial powers; a full, strong, and frequent pulse; a more free and regular respiration than in the preceding stage, though still more oppressed and hurried than natural; great pain in the forehead; pain in the back and extremities; sometimes slight delirium just before the commencement of the succeeding stage; a scanty and deep-coloured urine without sediment. This stage is as various in its duration in different cases, as the preceding one. It continues, however, almost always much longer than the cold stage. The temperature of the skin is always very considerably augmented. Fordyce observed it as high as 105° of Fahrenheit. This stage terminates in the last, or,—

The sweating stage.—When the perspiration begins to appear, an obvious abatement of all the febrile symptoms occurs. The sweat appears at first about the head and breast, and thence gradually extends over the whole surface of the body. On the appearance of this evacuation, the pulse loses its *hardness* and *frequency*, but still retains its *fulness*. The breathing at the same time becomes free and natural; the febrile heat subsides rapidly; and the urine, though still very high-coloured, deposits a lateritious or pale-red sediment. This gradual melioration of the febrile symptoms continues under the free flow of the perspiration, until the paroxysm terminates in a state of perfect *convalescence* or *apyrexia*.

The apyrexia, or intermission, though entirely free from febrile phenomena, cannot, however, be regarded as a state of health; for during this interval, the patient usually feels some degree of languor; becomes easily fatigued; complains often of a want of appetite, and an indisposition to bodily or mental exertion. He possesses, moreover, an unusual degree of sensibility to the impressions of cold air; and his countenance exhibits a pale and sickly aspect. In some, though comparatively few instances, the appetite is good, and the patient experiences no feelings of indisposition whatever during the intermission. The more conspicuous the symptoms of imperfect health are during the intermissions, the more difficult, in general, will it be to prevent its recurrence; or, the more readily will it relapse after it has been suspended.

Intermittents of every type are subject to certain prominent modifications in relation to their general character, which, as they have important practical bearings, deserve particular attention. We meet with intermittents, for instance, which are attended with unequivocal manifestations of an *inflammatory character;* others occur, in which symptoms of great *internal venous congestions* are equally conspicuous; a third variety of intermittents will exhibit strong symptoms of *biliary and gastric irritation;* and a fourth variety will be characterized by

phenomena indicative of a more or less *malignant character.* According to these circumstances, intermittents may be divided into the four following varieties, viz. 1, the *inflammatory;* 2, the *congestive;* 3, the *gastric;* and 4, the *malignant* intermittents.

1. *Inflammatory intermittents* occur most frequently during winter and in spring. Quotidians are more apt to assume this character than tertians; and tertians more apt than quartans, (Richter.) In young, robust, and plethoric subjects, vernal quotidians are especially prone to manifest inflammatory symptoms. Intermittents of this character, generally begin with strong rigors. In the hot stage, the temperature of the surface is very intense, and the pulse is peculiarly strong, hard, and full. The most characteristic marks of inflammatory intermittent, occur, however, during the intermission. However profuse the perspiration in the last stage, the apyrexia does not become complete. The pulse remains quick, somewhat tense and accelerated; the thirst is still considerable, and the skin dry and warmer than natural; the whole system is irritable; the temper is fretful or discontented; slight headach is experienced; and transient pains are often felt in the extremities and the back. In many instances a short and dry cough occurs, with some oppression in the chest, or other pectoral affections. Richter observes, that inflammatory intermittents are very rarely attended with symptoms of gastric disturbance from vitiated secretions, bile, &c. The intermissions in agues of this kind are usually short.—(Richter.)

2. *Congestive intermittents* occur seldom. They happen generally in persons of exhausted and debilitated habits; and in such as are of an irritable and nervous temperament, connected with habitual or accidental debility. They are characterized by a very protracted cold stage, deep-seated pain in the head, vertigo, fainting, a sense of weight or oppression in the breast, coma, a small and weak pulse; the hot stage coming on very slowly, and developing itself very imperfectly, so that instead of hot skin, flushed countenance, and a full and vigorous pulse, the system continues to be oppressed, the skin scarcely warm, the countenance pale and contracted, the breathing confined and anxious, and the pulse frequent, small, and tense, with an internal sensation of heat.

3. *Gastric intermittents* are characterized by prominent symptoms of gastric and intestinal irritation, redundancy of biliary secretion, and other saburral matters lodged in the alimentary canal. The ordinary intermittents of the temperate climates, occurring in autumn, are usually of this kind. Intermittents of this modification are attended with a foul and bitter tongue; much nausea and bilious vomiting; great pain in the

forehead ; diarrhœa, an icteric hue of the skin and albuginea ; urine loaded with bilious matter ; thirst for acid drinks, and sensation of weight or fulness in the right hypochondrium. Intermittents of this kind are apt to produce visceral disorders, more especially indurations of the spleen and liver; and finally, a cachectic condition of the system which it is often extremely difficult to remove. (Richter.)

4. *Malignant intermittents* are of frequent occurrence in *hot* climates, and are always of the most dangerous character. They are characterized by a very copious and *fetid* perspiration in the third stage, together with colliquative hæmorrhages from various parts of the body, sometimes petechia, and other marks of malignity. They run their course with great rapidity, death usually taking place in the third paroxysm. (Alibert.)

Irregular and anomalous intermittents. Intermittents do not, however, always pursue the regular course that has just been described. In some instances, anomalies of a remarkable character occur, both in relation to the phenomena, and the succession of the stages of the disease. I have known a case, in which the two first paroxysms occurred, in a perfectly regular manner ; but after employing arsenic, unsuccessfully, during the second and third intermissions, the paroxysms returned without a cold stage, the patient experiencing, instead of it, a peculiar feeling of numbness on the top of the head, with great dulness of hearing, for about forty or fifty minutes before the supervention of the hot stage. There are instances on record, of the inversion of the natural order of the cold, hot, and sweating stages ; several distinct instances of which occurred under my observation in the fall of 1828. Cases have been noticed, in which the perspiration, in the third stage, was substituted by diarrhœa ; and Cleghorn states, that he saw tertians, which terminated by an increased flow of urine, with scarcely any sweat.

In infants, the paroxysms of intermitting fever are sometimes ushered in by convulsions ; but the convulsions are most apt to occur at the commencement of the hot stage. Indeed, the cold stage of very young children is seldom marked by distinct *rigors*. A pale and shrunken countenance, with an obvious reduction of the temperature of the surface, yawning, and stretching, usually manifest the presence of this stage in infants.

There are certain affections, not of unfrequent occurrence, which, from their strict periodicity, as well as from their apparent origination from the same causes that give rise to intermittents, are termed *masked agues, febres intermittentes larvatæ*. Thus, neuralgia, in various parts of the body, sciatica, rheumatism of the eye, hæmicrania, toothach, cramp in the stomach, dysentery, cholera, hiccough, mania, and acute pains in other

parts of the body,* have been known to recur in a manner strictly periodical, and to have yielded readily to the same remedies which are found to arrest the course of an ague. These affections, when thus perfectly periodical, generally manifest their alliance to intermitting fever, by being almost always preceded by a very slight sensation of chilliness, and by being attended with a moist skin and a turbid urine at the termination of the paroxysm. (Richter.)

Intermittents are sometimes *complicated* with other affections, such as dysentery, cholera, jaundice, and visceral inflammations. The vernal intermittents are most apt to become complicated with inflammatory affections; and those which occur in autumn are most frequently combined with disorders of the alimentary canal and nervous system. Paralysis and apoplexy, according to the observations of Dr. Macculloch, are by no means uncommon occurrences in intermitting fever; and they occur, sometimes, as direct consequences of the influence of the miasmata, without any distinct febrile phenomena.

Many of the affections which supervene in intermittents, appear to result from the inroads of the fever itself on the constitution; but the majority of these maladies, whether occurring as concomitants, sequelæ, or substitutes of the fever, are, without doubt, direct consequences of the deleterious influence of the remote cause. Dropsy, jaundice, scirrhous, &c. are, probably, usually the result of the general febrile disease. Unquestionably, too, aneurismal enlargements of the heart and large vascular trunks, must be regarded as the consequence of the violent congestion of the blood which occurs in the internal organs during the cold stage. In the same way, apoplexy sometimes occurs in the commencement of intermitting fever; for the blood recoils so powerfully from the external to the internal vessels, in the cold stage of the disease, that those who are, in other respects, predisposed to determinations to the head, are liable to suffer apoplectic oppression of the brain from this cause. Dr. Macculloch warmly opposes the opinion, that in apoplexies of this kind, there is any particular congestion of blood in the brain. The cases which I have, myself, seen, however, do not permit me to doubt that they were essentially connected with cerebral pressure from inordinate vascular turgescence. It is not unlikely, however, that those apoplectic symptoms which occur as the immediate consequence of the powerful influence of miasmata on the brain, independent of chills, or torpor of the vessels of the surface, are in no way dependant on cerebral compression from sanguineous congestion.

* Macculloch on Intermittent and Remittent Fever, &c. See also, Journ. General de Med. No. 291, foot note. Also, Gazette de Santé, No. 17.

Paralysis, neuralgia, mania, &c. as well as the above named affections of the alimentary canal, are, however, almost invariably direct malarious affections; occurring, with or without any manifest febrile phenomena; and frequently exhibiting their affinity to intermitting fever, by their paroxysmal and strictly periodical character. For a full exposition of the nature, phenomena, and management of these miasmal diseases, the reader is referred to Dr. Macculloch's Treatise on Intermitting and Remitting Fever.

But if intermitting fever has a tendency to *produce* other affections, it has been found also to *remove* various diseases of a chronic and obstinate character. Celsus observes, that intermitting fever is often remedial of itself. (Lib. II. cap. 8. p. 70.) The tendency of quartans to cure epilepsy, is mentioned by Hippocrates; (Epidem. 1.) and we are told that the celebrated mathematician De la Hire, was permanently relieved of an habitual and most violent palpitation of the heart, by an attack of ague of the quartan type, (Academ. des Sciences, l'An. 1718. Hist. p. 110.) Fordyce states, that rheumatism, cutaneous eruptions, hysteria, and indigestion, have been effectually removed by attacks of intermitting fever; and Vogel asserts that he has known asthma and hypochondriasis cured by this disease. Almost all writers, however, attribute much more sanative power in this respect to *quartans* than to either of the other two types.

Intermittents, when suffered to pursue their course without being controlled or embarrassed by external influences, appear to have a natural tendency to terminate spontaneously, after a certain number of paroxysms have been passed through. Quotidians, for instance, if they are simple and regular, will tend to terminate their course on the seventh day, and tertians on the fourteenth. Quartans will generally run on to the sixth week. Of the natural tendency of the two former types to terminate at about the periods just indicated, I have the strongest conviction from my own observations. The disease may not generally terminate spontaneously at these periods, but its tendency to do so will be such, that if assisted by a proper febrifuge, it will not only more certainly be arrested, but a *relapse will scarcely ever occur*, unless the remote cause continues to act on the system. Every one who has had considerable experience in the treatment of intermittents, must have been struck with the great frequency of relapses, even where the patient has been removed out of the sphere of the influence of the remote cause. From what I have observed in relation to this subject, I will venture to say, that if the usual febrifuges were withheld until after the seventh paroxysm, such an occurrence would, under all circumstances, be comparatively very rare. I have already adverted to the tendency of intermitting fevers to relapse at stated inter-

vals; and although I cannot undertake to reconcile the apparent opposition in these statements, namely, that fevers of this kind tend naturally to *terminate* and also to *relapse* at the septenary periods; yet of the truth of the observation I entertain the strongest conviction.

Prognosis.—The intermittents of temperate climates are among the least dangerous of febrile affections. In hot latitudes, however, they often assume a highly malignant and fatal character. Death from a simple and mild intermittent does nevertheless sometimes occur; and when this happens, it is nearly always in the *cold* stage, and with symptoms of apoplexy. I have met with two fatal instances of this kind. The violent internal congestions which occur during the cold stage, are well calculated to produce cerebral oppression and apoplexy, particularly in persons who are naturally predisposed to this malady. In general, much less danger is to be apprehended from this disease in the young, robust, and vigorous, than in persons of feeble, nervous, and depraved habits of body. In individuals of the latter habit, there is sometimes not sufficient vital energy, to react and develope the hot stage, and they occasionally sink into a state of lethargy or fatal apoplexy. The more irregular an intermittent is, in relation to its type and particular phenomena, the more difficult in general it is to effect a permanent cure. Postponing agues are more favourable than such as anticipate their paroxysms. The latter tend to the continued form. A scabby and humid eruption about the mouth and nostrils is a favourable sign. When habitual discharges, whether natural or morbid, reappear after having been suppressed by the ague, perfect convalescence generally soon follows. The state of the digestive functions has an important bearing on the prognosis of intermittents. So long as digestion is performed with considerable activity, and there are no decided marks of gastric irritation, very little difficulty in general will be experienced in removing the disease. But when these functions are prominently deranged, and there are manifestations of much debility of the stomach, we may calculate on meeting with considerable difficulty in our efforts to prevent the return of the paroxysms; for even should a temporary stop be put to the progress of the disease, the liability to relapse in this state of the digestive apparatus, is such as to render the best directed treatment often abortive.

Delirium seldom occurs in intermittents, and when it does happen, it must be viewed as unfavourable; and even more so than mere coma. In malignant intermittents, delirium is common; indeed, it may be regarded as almost peculiar to the worst varieties of this disease. Difficult and oppressed breathing, attended with hiccough and frequent deep sighing, is a bad sign. Sydenham observes, that a tumid and hard abdomen, with swel-

ling of the tonsils, is in general indicative of a fatal termination. One of the most unfavourable signs is a profuse and prolonged colliquative and offensive diarrhœa. Bloody urine also is very unfavourable. The latter symptoms are almost exclusively confined to the violent intermittents of *hot* climates. When, *during the intermission*, the patient remains very much debilitated and oppressed, and the feet and legs are œdematous, considerable danger may be, justly, apprehended.

Tertians are, in general, more readily removed than quotidians, and quotidians than quartans. Intermittents not unfrequently change into the remittent form; and this conversion is, of course, always an unfavourable occurrence. When such a change is about to happen, the paroxysms of the intermittents are progressively prolonged until they run into each other. *Simple* tertians always reduplicate their type, before they assume the continued or remittent form. The conversion of intermittents into the remittent form, is particularly favoured by whatever is capable of causing or augmenting the general phlogistic condition of the system, and especially by the accidental supervention of some internal inflammation. The unseasonable employment of tonics and stimulants is frequently productive of such changes in the form of the fever.

Causes.—The only general cause of intermitting fever is *koino-miasmata.* Intermittents are the simplest, and in general the least dangerous of all the febrile diseases produced by this variety of miasmata. In the vicinity of marshes, we may often trace the various grades of miasmatic fevers from the most violent and fatal to the simplest and mildest varieties, as we progressively remove from the focus of the deleterious exhalations towards the circumference of its influence. On the borders of the soil, whence the miasmata emanate, if very copiously engendered, continued and highly fatal cases of bilious fever will prevail; at a greater or less distance from this point, mild remittents will predominate; and at a still more remote situation, intermittents will be most common. From the same circumstance, the first diseases which occur in miasmatic districts are generally intermitting fevers; as the season advances, remittents occur, and finally prevail with great violence; as the cold weather approaches, and the extrication of miasmata begins to diminish, intermittents again become more common, and the remitting fevers gradually disappear.

The tendency of *koino-miasmata* to produce intermittents, is much enhanced by sudden changes of atmospheric temperature. Intermittents are never more prevalent than when the days are very warm, and the evenings and mornings cool and damp. In some instances, several weeks elapse between the reception or impressions of the miasm, and the occurrence of the fever. I

have repeatedly known persons to be attacked with intermitting fever in this city, several weeks after they had been exposed to *koino-miasmata* in the country.* Persons who have been exposed to miasmata, should carefuly avoid every thing capable of debilitating the system, and particularly the digestive organs, for at least two weeks after exposure.

Although *koino-miasmata* may be regarded as imcomparably the most frequent cause of intermitting fever, yet various other causes may, under favourable circumstances, give rise to this form of fever. Richter observes, that worms and other causes of intestinal irritation have been known to produce intermitting fever. He mentions, also, suppressed catamenia, and hæmorrhoidal discharge, as well as the drying up of old ulcers, as occasional causes of intermitting fever. I have seen one instance, in a delicate child, where a distinctly formed ague was manifestly produced by intestinal irritation from too free an indulgence in irritating articles of food. An interesting case is related by Mr. Earle,† in which a regular intermittent was produced by the irritation of a small piece of dead bone in an old wound, and which was at once arrested on removing the irritating substance. It would seem that either the generation of miasmata, or their power of producing intermitting and remitting fevers, is greatly controlled by certain occult conditions, wholly unconnected with any appreciable circumstances, with regard to atmospheric temperature, or any of the other known requisites for the production of this poison. In certain districts of the temperate latitudes, malarious fevers will sometimes disappear, or become extremely rare, for a number of successive years; and then gradually become more and more common, until, in the course of a few seasons, they assume the prevalence of an epidemic; and yet, no material difference will be obvious between these periods of exemption from, and prevalence of disease, in relation to what are deemed the necessary concomitants for the production of miasmata.

Proximate Cause.—In relation to the proximate cause of this

* Upon this point Dr. Macculloch differs, so far as I know, from every other writer who has attended to this subject. He maintains, that the interval between the application of the miasmata, and the first manifestations of its morbific effects on the system, seldom, if ever, extends beyond twenty-four hours. "I know not," he says, "if physicians have fairly observed that the supervention of intermitting fever may be later than twenty-four hours from the exposure to the cause;" and he asserts that the attack of intermitting, as well as remitting fever, "sometimes instantaneously follows the application of the poison." That the febrific powers of miasmata may be manifested very soon after they are applied, cannot be questioned, but the assertion that the period between the reception of the poison, and its obvious effects, does not probably extend beyond twenty-four hours, is undoubtedly contradicted by almost daily experience in our own climates.

† Medico-Chir. Review, January 1827.

form of fever and of its periodicity, we may at once confess our entire ignorance; for all that has hitherto been advanced in relation to these mysterious subjects, amounts to nothing more, at best, than some ingenious conjectures and hypothetical speculations, with a great deal of crude and absurd reasoning and idle suppositions. As to the sentiments of Broussais, which place the proximate cause of this and all other fevers in an inflammation of the mucous membrane of the alimentary canal, it can neither be profitable nor interesting to repeat again what I have already advanced in refutation of its correctness.

Treatment.—The treatment of intermittents must be considered under two distinct heads: namely, that which is proper during the paroxysm; and that which is to be employed during the intermissions, and upon which the radical cure of the disease depends.

In the ordinary regular intermittents of the temperate latitudes, remediate interference during the paroxysm of the disease is extremely uncommon, and is indeed very generally altogether unnecessary. Nevertheless, where the febrile excitement becomes very violent in the hot stage; or where the system is so enfeebled that dangerous congestions and oppression occur during the cold stage, medicinal aid is not only proper, but sometimes absolutely essential to the safety of the patient. During the cold stage of an intermittent, the patient ought to be kept moderately warm; and as the thirst is generally very urgent, bland and warm drinks should be freely allowed. In general, however, *stimulating* drinks, and the application of much artificial heat, with the view of moderating the distressing sense of cold, are improper; since they very rarely lessen the feeling of chilliness, and tend often considerably to increase the violence of the succeeding *hot* stage. These observations apply to the regular disease, occurring in individuals of sufficient vital energy to develop the hot stage, without any artificial support. When the patient is feeble, nervous, or exhausted, it will, generally, be beneficial to aid the vital powers during the cold stage, both by external and internal exciting agents, more especially, by the applications of external heat. Without such aid, the cold stage will probably be greatly prolonged, and the system so oppressed, by internal congestions, as to prevent the regular development of the subsequent stages.

Various means have been adopted for the purpose of curtailing the cold stage; and of these, emetics and opium appear to be the most efficient. An *emetic* administered at the beginning of this stage, will frequently put a speedy termination to its progress; and a full dose of *opium*, taken a short time before the expected occurrence of the chills, will generally have the same good effect. This latter remedy was particularly recommended by Dr. Trot-

ter; and other eminent physicians have given their testimony in its favour. In debilitated and relaxed habits the exhibition of a grain or two of this narcotic, just before the accession of the chills, will generally prove decidedly beneficial. I have frequently resorted to it in cases of this kind, with obvious advantage. In persons of a full and vigorous habit of body, it will rarely do any good, and may readily do mischief by increasing the violence of the reaction and of the determination to the brain, in the hot stage. Compression with the tourniquet, also, was some years ago, strongly recommended to the profession, for arresting the cold stage of intermittents, by Dr. Kellie.* I have known it to be employed in four cases, and although the effects of it were by no means equal to those which Dr. Kellie ascribes to it, there was, nevertheless, a manifest impression made on the violence and progress of the chills. Dr. Kellie asserts, that by obstructing the circulation in an upper and in a lower extremity, by means of a tourniquet, we may in general, stop the cold stage in three minutes; and that if the compression be made immediately previous to the accession of the cold stage, it will be entirely prevented. The limited experience which I have had in relation to this practice, does not confirm this very favourable account of its effects; although *some*, and occasionally perhaps *considerable* advantage may, no doubt, be obtained from it. I should apprehend, however, that in vigorous and plethoric subjects, considerable danger must attend this practice, from the tendency which it must have to favour vascular turgescence of the brain; and thereby dangerous oppression or apoplexy.

Within the last two years, Dr. Mackintosh has published some highly interesting observations on the utility of blood-letting in the *cold* stage of agues, which though contrary to the sentiments universally entertained, concerning the character of this stage of febrile development, and the known tendency of blood-letting, are nevertheless too strongly confirmed, by well attested facts, to justify us in rejecting them, without farther experience. "There are few things," says a late writer, "more repugnant to the imagination of a medical man than that of venesection in the cold stage of intermittents. Books and lectures all inculcate a diametrically opposite practice. We see the face and the surface of the body pale and cold; the pulse feeble and quick; the teeth chattering; the whole body shivering; and the suffering patient huddling himself up in all the clothes he can find to keep the spark of life from being extinguished! The very idea of abstracting the vital fluid, which seems almost entirely to have vanished, is horrible. But yet, when we come to reflect that

* Medical Commentaries for the years 1794—1797, by Dr. Duncan of Edinburgh.

the blood has only shifted its place from the circumference to the centre, and that the internal vessels and organs must now be gorged with this fluid, and as it were in a state of suffocation, there is nothing very incongruous in the attempt to relieve the suffering organs, by abstracting a portion of blood from the general circulation." Moreover, when we advert to the circumstance that blood-letting has been strongly recommended and successfully employed, to remove the internal congestions which occur in *typhus* fevers, where there is generally an actual deficiency or *impairment* of the vital energies, it does not appear so very extraordinary, that the same means should be adequate to restore the equilibrium of the circulation, or to remove the internal congestion in an ague, where the vital powers are not *impaired*, but only *oppressed*. Dr. Mackintosh states, "that he has seen men in the most severe sufferings from the chills relieved after the abstraction of six, eight, and ten ounces of blood; and he has known three ounces to suffice. The relief, which is the most perfect relief that can be conceived, is so sudden, when a good orifice is made, that it has surprised and delighted every one who has seen this practice." Dr. M. had this practice tried on himself in 1810; and, although bark and other remedies had entirely failed, he found that before twelve ounces of blood were drawn, "the rigors ceased with all their unpleasant accompaniments," and neither the hot nor the sweating stage ensued. "A pleasant sense of heat succeeded the painful one of cold; and, instead of weakness, he was sensible of an acquisition of strength." He afterwards bled many other patients in the cold stage of this malady, and uniformly with the same favourable results. This practice was put in operation in the Royal Ordinance Hospital, of Edinburgh, in the presence of many medical gentlemen, and must, therefore, be regarded as amply attested.* In a single instance I have drawn blood in the cold stage of this disease; and, in this case, it moderated the violence of the chills and curtailed their duration in a manifest degree. I have not since had a favourable opportunity of repeating this practice, but from the result of this case, and the strong testimony of Dr. Mackintosh, I feel inclined to give it a further trial, whenever an opportunity of doing so shall present itself.

In the *hot* stage, it sometimes becomes necessary to moderate the violence of the febrile excitement, especially when delirium or alarming local determinations take place. Blood-letting is of course the most direct and efficient means for this purpose, and where the indications for antiphlogistic measures are strong, it ought to be promptly employed. In agues of a decidedly phlo-

* Ed. Med. and Surg. Journ. April, 1827; and Medico-Chir. Rev. July, 1827, page 186.

gistic diathesis, blood-letting during the hot stage will often contribute considerably to the *successful* employment of the bark in the intermission. I have sometimes known the bark promptly efficient in arresting the disease after a copious blood-letting during the paroxysm, where it had previously failed. In cases attended with a very hot and dry skin, and a full and vigorous pulse, cool, bland and acidulated drinks are both grateful and salutary. A draught of *cold water* while the skin remains dry, will often speedily subduct the febrile heat and predispose to perspiration. It may also be proper, in instances of very high general febrile excitement, to exhibit some of the refrigerent diaphoretics—such as nitre—antimony—the saline effervescing mixture.* As soon, however, as the skin begins to be moist, cold drinks must be withheld. During the last or sweating stage, we may allow *tepid* drinks of a bland character freely.

When the stomach is extremely irritable—giving rise to frequent and violent vomiting in the cold or hot stage, tepid diluents should be given, until there is reason to think that the bile is discharged. Opium is, perhaps, our best remedy for checking excessive vomiting in this disease. This article does not often aggravate the violence of the reaction, when given in the hot stage, as might be apprehended. Indeed, Dr. Lind zealously advocates the propriety of exhibiting a full dose of opium, soon after the hot stage is developed, as a general practice. He asserts, that it takes off the burning heat of the fever, hastens the accession of the sweating stage, and often produces a soft and refreshing sleep, from which the patient awakes free from all complaints, and in full perspiration. He thinks, moreover, that the use of opium in the hot stage tends to obviate dropsy and jaundice. I have given opium in the hot stage to check vomiting, and have always found it to answer this purpose very promptly and completely, without any unpleasant consequences. I cannot, however, think that opium is a proper remedy in the hot stage of ague, unless it be in broken down constitutions, or in such as are feeble and exhausted by previous injurious influences —or unless it be employed to remove some accidental affection of a distressing or dangerous character. In cases where the reaction of the heart and arteries is incomplete, and where much internal congestion continues to exist through this stage, opium is, without doubt, a valuable remedy. To put a stop to excessive vomiting in this, as well as in other diseases, not attended with

* The following mixture is an excellent remedy for this purpose—

R. Spirit. Minderiri. ℥iv.
Spirit. Nitr. Dulc. ℥ii.
Vin. Antimon. ℥i.
Syrup Limonis, ℥i.
M. take a table-spoonful every hour.

phlogosis of the mucous membrane of the stomach, I know of no medicine which is more promptly and certainly effectual, as a solution of camphor in sulphuric æther, in the proportion of two scruples of the former to an ounce of the latter; of which 20 or 30 drops may be given with about ten grains of calcined magnesia every half hour until the vomiting is arrested. I have rarely found the second dose necessary.

Whatever advantage may result from remediate treatment *during the paroxysm*, universal opinion concurs in regarding the *intermission* as the proper period for the safe and certain *radical* treatment of intermitting fevers. In prescribing for the radical cure of intermittents, it is of no small consequence to attend to the particular character of the disease in relation to the four modifications or *varieties* mentioned above; for each of these requires some peculiar modifications of treatment.

1. *The inflammatory variety*, as has already been stated, is marked by symptoms during the intermission, which indicate an irritated and phlogistic condition of the system, incompatible with the salutary influence of the bark and the other febrifuge remedies of this kind. In this modification of the disease a strictly antiphlogistic treatment must precede the employment of the tonics usually resorted to. The patient must be put on an antiphlogistic regimen; one or two cathartics, composed of calomel and jalap—or calomel, succeeded in a few hours, by an ounce of Epsom or Glauber's salts, will be proper; and where the inflammatory diathesis is very conspicuous, blood-letting, nitre, antimonials, &c. are often indispensable. In cases of this character, blood-letting will, in general, prove most efficient in reducing the phlogistic habit, when it is practised pretty copiously during the *hot* stage. In cases of vernal intermittents, in which the bark or quinine had failed in consequence of the general irritated and phlogistic condition of the system, I have succeeded perfectly with these febrifuges, after the patient had taken one of the following powders,* every two hours during an intermission, and a small bleeding in the hot stage of the succeeding paroxysm.

In the *congestive* and *malignant* varieties of ague, it will seldom be proper to lose much time in preparing the system for febrifuge tonics. In such cases, the powers of the system must be economised, and tonics early and liberally resorted to. In the *gastric* modification, which is most commonly met with in the temperate latitudes, there exist obvious indications of gastric impurities and disorder—such as nausea; bilious vomiting and purging; foul tongue; loss of appetite; pains in the stomach and bowels; bitter or depraved taste, &c. In intermittents of this

* R. Pulv. nitrat. potassæ ʒiss. pulv. doveri gr. vj. calom. gr. vj. M. In chart. No. vj. dividend.

character, it will be peculiarly proper to attend to the state of the alimentary canal, before the bark or tonic remedies are resorted to. Mild mercurial purgatives are generally decidedly beneficial. In some instances, it may be necessary to repeat them several times before the bowels are brought to a proper state for the employment of febrifuges. Emetics, too, will often contribute much to the success of the bark or quinine. In intermittents of a well-formed inflammatory character, there are seldom any unequivocal manifestations of gastric impurities, and hence these evacuants are much less useful or important in them than in the variety I have termed gastric.

Among the various articles which have been recommended for the cure of intermittents, the *Peruvian bark* and its preparations, is, unquestionably, by far the most important. Within the last ten years, the sulphate of quinine has, in a great measure, taken place of the bark in substance, and in many respects, this preparation possesses important advantages over the crude material. It has indeed been said, that the bark itself will sometimes remove the disease where the quinine has failed ; but the converse may be said with equal correctness ; for I have, in several instances, succeeded with the latter, after the former had been used in large doses without success. Mr. Valpès, of Naples, in a recent communication to the French Royal Academy of Medicine, states, as the result of his inquiries, that the *sulphate of quinine* is preferable to the *cinchona*, in intermitting fevers, whilst the latter is preferable in the fevers formerly denominated *putrid*,* and which are produced by idio-miasmata.† From my own experience, I have not been led to think that there exists any essential difference in the febrifuge virtues of these two remedies ; but as the quinine is much less nauseous, and can be given in sufficient doses in a very small bulk, I should, from these advantages, always prefer it to the bark in substance, unless some idiosyncracy exist against its influence, which can be ascertained only by experience.

Much difference of opinion has been expressed, both in relation to the period of the disease, and the particular time of the intermission, at which the bark may be most effectually admi-

* Revue Medicale, Mai. 1828, p. 306.

† In March, 1825, the number of lunatics brought to the *Maison d'Aversa* in the kingdom of Naples, was so great, that it was found necessary to lodge them in a convent, which was not properly prepared to receive them. The most filthy of these unfortunate beings were put into a small dormitory, which was in a state of extreme filthiness. A fever soon broke out among them, which was at first regarded as a petechial fever, and was treated by antiphlogistics. The disease made a rapid progress, and became unusually fatal. The sulphate of quinine was finally employed, but this appeared rather to aggravate the symptoms, than to afford any advantage. At last, the *bark in substance* was given, and immediately resulted in the happiest effects.—*Revue Medicale*, 1828. *Mai.* 306.

nistered in this form of fever. It has been contended, that it will generally be much better to suffer several paroxysms to take place, before any attempt is made to arrest their recurrence. Recamier has recently advocated this practice, as both the most effectual and the safest to the future health of the individual. I do not at all doubt the correctness of this mode of management. Unquestionably, a great majority of our ordinary agues may be immediately arrested, and with perfect safety, by giving the bark, during the first or second intermission; but in this case relapses are much more common than where the disease has been suffered to run on to the fifth or seventh paroxysm. I have found agues arrested after the first or second paroxysm, relapse again and again, until they were suffered to run on to the fifth or seventh day, when a few doses of quinine put a permanent stop to their progress. It has long been my practice, when I have met with relapsing agues to suffer them to run on through five or seven paroxysms, before any attempt was made to arrest them, and I have invariably found this plan permanently successful. In cases which require preparation, especially in inflammatory intermittents, delay is of course essential, before the bark can be employed with propriety. I would not, however, lay it down as a general rule, that the disease should be suffered to run on through five or seven paroxysms; for where the apyrexia is very complete, and the patient experiences no feelings of illness during the intermissions, the bark may almost always be given with complete success, as soon as the bowels are evacuated by a suitable cathartic.* In instances of an opposite character, or such as have shown a tendency to return after a week or two, it will be very difficult to put a final stop to the paroxysms, if the febrifuge be employed during the first or second intermission. A case came under my notice, during the preceding autumn, which had already relapsed four times, and always punctually on the seventh day. After each relapse, the patient took quinine in full doses, which always arrested the disease for the short period mentioned. When he applied to me, I advised him to suffer his disease to go on for some time, without any other medicine than a mild purge every other day. He did so; and on the ninth day, the disease left him spontaneously and permanently.

The foregoing observations apply, of course, to the *regular* intermittents of the temperate latitudes; for, in that rapid and fatal variety which is termed *malignant*, no time should be lost by preparatory measures, but immediate recourse had to large and frequent doses of the bark, as soon as a favourable intermission occurs. The same rule applies to the disease occurring in very feeble, nervous, and exhausted subjects; for, unless it be

* R. Pulv. jalap . . . Calomel ää. gr. x. M.

speedily removed, the system may sink under the repeated shocks of the paroxysms.

With regard to the particular period of the intermission at which the bark may be most successfully given to arrest the succeeding paroxysm, a diversity of sentiments have been expressed by writers. Some have advised its employment in large doses immediately after the sweating stage has passed off; whilst others recommend it to be given largely, "as near to the time of the expected paroxysm as the condition of the patient's stomach will allow," (Cullen.) There are others, again, who think it best to exhibit the bark in divided and frequent doses, throughout the whole period of the intermission, (Fordyce.) A few years ago, Dr. Ridgway published some cases, which go to show, that *one large dose* of cinchona given as near as possible to the commencement of the approaching paroxysm, will as certainly avert the paroxysm, as when given in repeated doses throughout the intermission.* Since Dr. Ridgway's publication, Dr. Brown, of Boston, has published a small work, in which he adduces testimony of a similar purport.† According to Dr. Brown's experience, two or three grains of the quinine taken just as the first symptoms of the approaching paroxysm are experienced, will, when followed up at intervals with a second, third, and sometimes a fourth dose, almost invariably put a stop to the disease. When given just as the cold stage commences, "its influence over the rising symptoms becomes manifest in a few minutes; the pulse becomes more full and distinct; the respiration more easy; the skin acquires its natural temperature;" and, in eleven minutes in his own case, "not one unpleasant symptom remained." This state, however, generally continues but a short time, and it becomes necessary to repeat the dose, sometimes three and even four times before the paroxysm is subdued. Dr. Ridgway gave an ounce of the bark at once, as soon as the premonitory symptoms of the paroxysm were felt, and always found it to prevent the attack. There can be no doubt that the disease may be speedily arrested in this way; but it may be reasonably questioned, whether it possesses any real advantage over the plan of exhibiting this febrifuge in efficient doses during the *latter period* of the intermission. I have generally prescribed the quinine in two grain doses every hour, commencing about six hours before the beginning of the approaching paroxysm; and I have had no cause to be dissatisfied with the consequences. Indeed, I have reason to apprehend that a large dose of quinine given during the chills, is calculated to produce very disagreeable effects. In two instances, one a deli-

* London Medical and Physical Journal for April, 1825.

† A Treatise on repelling the Paroxysm of Intermittent Fevers. Boston, 1826.

cate married lady, and the other a lad about twelve years old, a most singular and raving species of maniacle affection ensued, *apparently* from taking large doses of this medicine *after the chills had commenced.* In both instances this alarming mental disturbance continued for several hours. I may be wrong in ascribing it to the causes here assigned, but the circumstances strongly favoured the suspicion.

Whatever views we may adopt, however, with regard to the *time* at which it may be best to begin with the bark or quinine, there can be no doubt concerning the propriety of giving *large* doses,* in such a manner as to make a decisive impression on the system in the latter period of the intermission. I am well satisfied that two or three large doses—three grains of the quinine, given two or three hours before the paroxysm, will do more towards averting it, than a *larger* quantity exhibited in small doses throughout the whole interval of the apyrexia. In relation to the propriety of employing emetics and cathartics as preparatory measures for the use of the bark, authors express contradictory opinions. Unquestionably, where the signs of gastric impurities are conspicuous, and there exists no urgent necessity from the nature of the case, to arrest the disease promptly, it will be proper to evacuate the alimentary canal previous to the employment of the bark. These evacuants will also be useful in cases where the inflammatory habit is so strong as to prevent a complete apyrexia. Nevertheless, in the ordinary cases of the disease, where there are no signs of a loaded state of the bowels, and the apyrexia is very complete, the bark may be successfully employed without either previous purgation or emesis. Upon the whole, however, I should in all instances of this disease, not attended by malignity or great prostration, prefer one or two mild cathartics, before the bark is taken, for the reasons already mentioned.

The Peruvian bark has been frequently accused of having a tendency to produce visceral indurations and other unpleasant consequences, such as rheumatism, dropsy, &c. This accusation is, however, wholly unfounded. No doubt, indeed, can exist that these and other injurious consequences may be produced by the *iniudicious* employment of this remedy. When given, for instance, in agues, attended with strong marks of an inflammatory condition of the system, without proper antiphlogistic preparatory measures, we can readily conceive that the bark would favour the natural tendency of such cases to terminate in these disorders. In this respect, however, the bark does not differ

* If the bark in substance be employed, not less than two drachms ought to be administered at each dose. Such doses taken at intervals of an hour, or an hour and a half, within the last five hours of the intermission, will, perhaps, do all that can be effected by bark in this disease.

from other tonic and stimulating remedies; for it is not by any thing peculiar in the bark that these effects are produced, but simply by the power it possesses, in common with the majority of febrifuge remedies, of favouring the phlogistic diathesis, and the progress of obscure inflammations.

The bark is now generally given by itself. Formerly it was customary to give it in conjunction with various other remediate articles which were thought to augment its febrifuge powers. It is extremely doubtful, however, whether any combinations can materially improve its virtues; and unless some particular circumstance be present which may render the use of other remedies proper, or unless the bark by itself produce unpleasant or injurious effects on the alimentary canal, it will probably be best to employ it singly. When it causes much constipation, it may be usefully given as follows:

℞. Pulv. cinchon. condam. ℥j.
—— rhei ʒss.
—— muriat. ammoniæ ʒj. Misce. In chart. No. iv. dividendæ. One to be taken every hour or two.

When the bark purges, it should be given with small portions of Dover's powder; or opium. The former especially, acts beneficially in such instances, five grains of which may be given at each dose. Alkaline remedies become necessary in cases where there are signs of much acid in the stomach. The subcarbonate of potash is an excellent adjuvant to the bark in cases of this kind. From ten to twenty grains of the alkali may be given with each dose of the bark; and to prevent this from acting on the bowels, which it is apt to do, it is generally necessary to make a triple compound—viz. bark, subcarbonate of potash, and opium, or what is better, *confectio opii*. When the stomach is irritable, the bark will generally be speedily rejected. In this case we may sometimes cause it to be retained by uniting it with some aromatic substance, such as *serpentaria*, or *cloves*, or *nutmeg*, or the *calamus aromaticus*. The *serpentaria* is, perhaps, the best aromatic adjuvant to bark, where the stomach is too weak to retain it singly. I have, however, always found small doses of opium to answer better than any other remedy for this purpose. The addition of powdered black pepper answers extremely well in cases where the vomiting arises simply from gastric *debility*. Where, however, this occurrence depends on a highly *irritated* condition of the mucous membrane, neither this nor any other aromatic can be proper. In this condition, indeed, the bark itself cannot be employed until the gastric irritation is subdued by leeches, blisters, or cupping over the epigastrium.

The employment of the *quinine* is much less apt to produce the inconveniences just mentioned than the bark in substance;

but even this preparation will sometimes produce violent purging or vomiting—several very violent instances of which I have encountered in my practice. Formerly it was customary to employ the *decoction*, or the *tincture*, or what is better, both in union with each other, where the bark in substance could not be conveniently administered, or where the stomach rejected it. Since the introduction of the *quinine* into practice, however, this mode of exhibiting the cinchona has been but little employed; nor does it appear probable that any circumstances can occur which may not be as well met with this very convenient and concentrated preparation, than with either the decoction or the tincture of the bark. The most convenient and elegant formula for exhibiting the quinine, is perhaps, the following:

℞. Sulphatis quinæ gr. xvj.
Elixr. vitriol gtt. xvj.
Syrup. limonis ℥j. M. Dose—a tea-spoonful every hour or two for an adult.

As this mixture, though a very neat and concentrated one, is sometimes much objected to on account of its bitterness, especially by children, I have generally prescribed it according to the following formula, by which almost all the bitterness is wholly removed:

℞. Sulphat. quinæ gr. vj.
Elixr. vitriol gtt. x.
Pub. extract. glycyrrh ʒjss.
Aq. fontanæ ℥jj. M. Dose—a tea-spoonful for a child between two and five years of age.

In cases of ague, which, from long continuance, or from some previous malady, are attended with visceral indurations or enlargements, the quinine, or bark, must be given, either after a gentle mercurial course, or in conjunction with mercurial remedies. The blue mass will in general answer best for this purpose, as it is mild, and less apt to pass off by the bowels than calomel. In many instances of this kind, the bark will, in fact, fail entirely in putting a stop to the continuance of the disease; and I have known it to do manifest mischief even when given in conjunction with mercury. In such cases, mercury is the appropiate remedy; and, under careful management, will rarely fail to arrest the disease. From three to five grains of the *blue mass*, taken thrice daily, until the gums become slightly affected, will generally suffice to remove the complaint.

Besides *bark* and its *preparations*, a vast variety of other remedies, drawn both from the mineral and vegetable kingdoms, have been employed with success, in the treatment of intermittents. As nearly all of them are, however, confessedly inferior to the cinchona, it will be sufficient here, barely to mention them. The most efficient of these articles are the following: viz. The

barks of the *dog-wood* (cornus florida;) of the *American tulip poplar* (Liriodendron tulipfera;) of the *horse-chesnut*, (E. hypocastanum;) of different *oaks;* of different species of *willow;* the *Virginia snake-root; colomba; gentian; quassia*, &c. *Coffee* is highly recommended by Grindel; given in doses of from 15 to 20 grains every hour, it is said almost invariably to arrest the disease, (Richter.) The black, or cellar *spider's web*, is highly recommended by Dr. Robert Jackson,* as a remedy for intermittents. He is of opinion, that it prevents the recurrence of the intermittent paroxysms more abruptly and more effectually than even bark or arsenic." I have employed this article in six cases; two of these were speedily cured, the others resisted its powers entirely. Shrader speaks of this article as an effectual remedy for agues, in his Dispensatory, published as early as 1644. It certainly possesses very considerable powers in allaying morbid irritability, and in calming the excitement both of body and mind. In my own person, it produces the most delightful state of mental and corporeal tranquillity, far exceeding that which is caused by opium.† It is given in five or six grain doses every three or four hours. The *muriate of ammonia* is favourably mentioned by Richter as a remedy in this disease.‡ He considers it especially useful in agues attended with gastric impurities, or a loaded state of the bowels; and in cases connected with visceral indurations. It should be given in union with quinine or cinchona in substance. I have used it myself, in cases attended with induration and enlargement of the spleen, and with the most favourable effects. The *muriate of ammonia* is, perhaps, the most powerful remedy we possess for resolving indurations, when given in very large doses internally. In Germany, it has of late years been much and very successfully used in enlargements of the prostrate gland, and other similar affections. In my own practice, I have had the most satisfactory proofs of its very excellent powers in this respect. I have given it to the extent of three drachms daily. In intermittents, with indurated spleen, it may be given in combination with quinine, in the proportion of twenty grains of the muriate of ammonia to two grains of the latter. The former ought to be continued after the quinine may no longer be necessary—that is, after the paroxysms have been arrested.

Among the mineral preparations, *arsenic* is, undoubtedly, the most efficient, with the exception, perhaps, of the *sulphate of zinc.* Arsenic was employed in this disease near a century ago,

* London Medical and Physical Journal, vol. xxi.
† Eberle's Therapeutics, vol. ii. p. 121, first edition
‡ Specielle Therapie. vol. ii.

by Jacobi;* but it was not till Fowler and Brera published their experience, in relation to its medicinal powers, that it was brought into general notice as a remedy in agues. It is, unquestionably, a very efficient remedy in this disease; but, in individuals of a cachectic habit, or where there is a scorbutic tendency, it is apt to cause dropsical effusions, as well as great debility and symptoms of general depravation of the system. It appears, moreover, to be improper in phthsical constitutions, and where a strong phlogistic tendency prevails. Of the tendency of arsenic to produce anasarcous effusion, I have had a strong illustration within the present year. I prescribed Fowler's solution to a syphilitic patient, and, although his nodes and nocturnal pains were removed, he became universally anasarcous. Arsenic appears to be best calculated to remove this disease without detrimental consequences, in individuals of a firm and vigorous constitution. The usual mode of prescribing it is in the form of Fowler's solution, or the liquid arseniate of potash. From 8 to 12 drops may be given every four or five hours during the intermission. I have generally given it in substance in union with opium, formed into pills, in the proportion of one-tenth of the oxyd of arsenic, to one-fourth of a grain of opium every three or four hours during the apyrexia. *Bietts' arseniate of ammonia* is, I think, decidedly the best arsenical preparation for internal use. Since the publication of the first edition of this work, I have employed this *arseniate*, in various affections—particularly in an instance of periodical neuralgia, and in several instances of *herpes* with peculiar advantage.†

The *sulphate of zinc* is an excellent remedy for the cure of intermittents. I have very rarely failed to arrest the disease as promptly with it as with quinine. Dr. Firth, in a letter to Dr. S. Mitchell, of New-York, dated Calcutta, 1805, speaks in the most favourable terms of this article as a remedy in intermittents. He asserts, that while prescribing in the Philadelphia Dispensary, he found it to cure cases in which both the bark and the arsenic had failed;‡ Mr. Brand also observes that "in the cure

* De Arsenico sale alcalico domiti usu interno salutari.—(Acta Academ. Elet. Mogunt. tom. i. p. 116.)

† This preparation is made by dissolving one part of the oxide of arsenic in four parts of nitric acid, with half a part of muriatic acid. This solution is then to be saturated with carbonate of ammonia. The supernatent fluid must be slowly evaporated until the crystals of the *arseniate* of ammonia are formed. One grain of this salt is to be dissolved in an ounce of distilled water, to which a small portion of the compound tincture of lavender may be added. Of this solution, from thirty drops to one drachm may be given, in divided doses, in the course of 24 hours.—Casper's Charakteristik der Franz. Med. p. 204.

‡ New-York Medical Repository, 1806.

of intermittents, the sulphate of zinc is an admirable tonic." He gives the following formula for using it:

℞. Zinci sulphatis, gr. jj.
Aq. cinnamon.
——distillat. āā ℥jss.
Tinct. calŏmbæ ℥j.
M. fiat mistura. A table-spoonful is to be taken every three or four hours.

I have hitherto usually employed it according to the following formula:

℞. Sulphat. zinci, gr. x.
Pulv. capsici. ann. ℈jj.
Conserv. rosar. q. s. M. in pil. No. xl. divid.
S. One to be taken every two hours during the intermission.

Black pepper, also, is strongly recommended by Dr. L. Frank for the cure of intermittents; and my own experience has afforded me several examples of its usefulness in this way. It is given in doses of from five to ten grains every two or three hours, either alone or in combination with some of the bitter tonics.*

Tartar emetic has recently been successfully employed in intermittents by Recamier, at the *Hotel Dieu.*† Out of seven cases, five were quickly cured by tartar emetic given in ptisans, so as to produce both emetic and purgative effects. This article has also been employed externally with complete success in this disease. Dr. Pommer states, that in the winter of 1815, he was frequently disappointed with the use of the cinchona, in the intermittents which occurred in the army of Wurtemburg, encamped on the Loire and Allier. Observing "that the fever generally disappeared on the eruption of pimples or pustules on any part of the body," he was induced to try what an artificial eruption would do towards curing those cases that had resisted the regular treatment. He accordingly directed frictions with the tartar emetic ointment on the epigastrium, and found it successful in every case as soon as the pustules appeared.‡

There are few diseases, over which the imagination exercises a more powerful controlling influence, than intermitting fever. In all countries and ages, this malady has been peculiarly favourable to the extravagant pretensions of superstition and imposture. Amulets and the most absurd practices have been always more or less in vogue, among the common people, as means for arresting the progress of this disease; and the reality of a mysterious power in these spells, is sufficiently demonstrated to the minds of the vulgar, by the occasional disappearance of the disease under their occult influence.

* Journal Complemént. du Diction. des Sciences Med. No. 22.
† Revue Medicale for December, 1826.
‡ Journ. der Practischen Heilkunde, 1823.

So intimate and strong, indeed, are the relations which subsist between the physical and moral elements of our nature, that there are few, if any diseases, in which we may not derive important advantages, from calling to our aid the invigorating powers of hope, or dissipating the depressing emotions of sorrow and fear, and diverting the mind from the causes, phenomena, and probable consequences of the disease, to objects of a more pleasing and hope-inspiring character.

Any strong mental emotion occurring shortly before the usual period of the paroxysm will sometimes be sufficient to prevent its accession. It is especially, however, that condition of the mind, which constitutes faith, or strong belief—and which the ignorant frequently yield to the most absurd practices, that opposes the strongest and most effectual barrier to the progress of this and other periodical affections. Dr. Macculloch asserts, however, that the curative effects of moral influences of this kind, are almost entirely limited to primary attacks, "or those which have, at least, not relapsed often;" and he adds, that they are very seldom successful except in cases where all the circumstances of the disease are regular.

The periodical affections, mentioned under the head of anomalous or masked agues, often disappear spontaneously after having continued for some time. This is particularly the case with the periodical neuralgic affections arising from the influence of miasmata. In some instances, however, they assume a persistent course, and yield only to proper remedial impressions. In general, the most efficient remedies for the cure of these affections are the same that are most effectual in regular intermittent fevers. A few full doses of quinine are sufficient often, to remove periodical hemicrania, tic douloureux, or sciatica, without any other auxiliary remedies. In some instances of this kind, arsenic is peculiarly beneficial. Dr. Macculloch, in reference to the use of bark and arsenic in these affections, observes, "that there are two leading circumstances under which they often disappoint us. This happens when the attacks of the disease are very irregular; and, secondly, when the disorder is of very long standing; while in exact corrsespondence with intermittents, these two states are very commonly united." In such irregular forms of miasmal disease, a "single blood-letting will sometimes render the type regular," and this being effected, the tonics just mentioned will frequently prove effectual. The constitutional influence of mercury, also, "will sometimes cause these tonics to be efficacious when they have failed before." (Macculloch.)

The sequela of this form of fever are often both obstinate and dangerous in their consequences. The most common of these morbid consequences of agues are:—œdema of the feet and legs; enlargement and induration of the liver and spleen: jaundice;

dropsy; and a general broken down state of the constitution. Authors mention other sequela of this disease—such as tympanitis, hemicrania, deafness, vertigo, paralysis, and epilepsy. The dropsy and jaundice, which occasionally supervene after very protracted agues, depend, no doubt, most commonly on the visceral indurations previously produced by the fevers or the miasmata. In nearly all these secondary affections, mercury may be regarded as our principal curative means. A gentle alterative course, will often suffice to remove most of these affections—especially the visceral obstructions, and the disorders which depend on them. Four grains of *blue mass*, with two of pulv. ipecacuanha, ought to be taken every night on going to bed, and a dose of salts taken every fourth or fifth day. When the disorder is obstinate, and does not show a disposition to yield to this moderate mercurial influence, two or even three pills may be taken daily, until the gums begin to exhibit marks of its influence on the system, when they should be discontinued, and resumed occasionally so as to keep up a very moderate degree of the mercurial action. Some mild bitter infusion may be taken in moderate doses twice or thrice daily, during the use of the mercury.

I have already mentioned the *muriate* of *ammonia*, as a valuable remedy for the removal of visceral indurations. The formula which I have employed with great success in cases of this kind, is as follows:

℞ Muriat. ammoniæ, ℥ss.
Pulv. extract. glycyrrh. ℥j.
Tart. antimonii. gr. j.
Aq. fontanæ, ℥viii. M. ft. S. Take a table-spoonful every four hours during the day.

Perhaps the most effectual remedy we possess for the removal of enlargement and induration of the spleen, arising from miasmata or intermitting fever, is *iodine*. I have employed it in one case, of long standing, with decided advantage, after mercury, the muriate of ammonia, antimony, &c. had been unsuccessfully used. From eight to ten drops of the tincture of iodine should be given three times daily, and a mild unirritating and digestible diet enjoined. We may also use the iodine in the form of frictions over the left hypochondrium;* but I apprehend the internal use of it will in general prove most effectual.

Tartar emetic, in very small but frequent doses forms, also, a very useful medicine in cases of this kind—more especially

* ℞ Hydriodat. Potassæ, ℈jj.
Axungiæ, ℥jss.
Liq. potas. caust. gtt. v.
M. Rub in, the size of a nutmeg of this ointment three times daily.

for the removal of that dry and icterode state of the skin, with œdema of the feet, which is so common a consequence of protracted agues. The best mode, perhaps, of administering this article in these affections, is to dissolve it in a large quantity of water, or some mild and pleasant ptisane. I have generally directed one grain of *tartar emetic* to be dissolved in about three pints of water, and to be used freely as common drink. By continuing this drink, so as to consume at least a quart in twenty-four hours, for eight or ten days, the skin generally becomes clear; the bowels regular; the cutaneous transpiration natural; and the enlarged spleen, or liver, manifestly diminished in size and hardness.

Relapses are very apt to occur after the paroxysms have been arrested. The circumstances which seem most capable of causing a relapse, are: exposure to cold and damp air; errors in diet and drink; the depressing passions, and renewed or continued exposure to the influence of *koino-miasmata*. All these causes ought, therefore, to be carefully avoided after the disease has been arrested, particularly where previous relapses have already occurred in the same case. It is especially important to avoid every thing which is calculated to derange the digestive organs. But nothing, I conceive, is better calculated to obviate relapses, than a delay in prescribing febrifuge remedies until the apyrexia is *complete*, and all signs of a general or local inflammatory condition are removed, and the disease has run on at least over the seventh paroxysm in quotidians, and the fourth in tertians. When an ague assumes a chronic character, none of the usual febrifuge tonics will do more than to cause a temporary suspension of the paroxysms. In cases of this kind, a gentle salivation will usually do more good than any other mode of management we can adopt. Even if the mercurial influence should not put a permanent stop to the progress of the disease, it will be apt at least to render the system more susceptible to the remedial operation of the bark and arsenic, and thus contribute materially to the ultimate removal of the disease.

CHAPTER V.

REMITTING FEVER.

Bilious Fever; Saburral Fever.—Febris Pituitosa; Febris Gastrica; Febris Intestinalis; Febris Mesenterica.

Between the simple autumnal *remittent* and *intermittent* fevers, there exists no essential or radical difference. They are produced by the same cause, and differ from each other only in the grade of violence and duration of the paroxysms. As remittents, however, assume a peculiar character, in relation both to their general phenomena and their course, and demand a treatment correspondingly modified, they are properly made a subject of distinct consideration, although some writers, following a different course, treat of them under the same general head.

Symptoms.—The symptoms which occur in the forming stage of remittents, do not differ from those which usher in the intermittent paroxysm. Languor, drowsiness, a sense of anxiety; aching pains in the back, head, and extremities, are the prominent symptoms of its initial stage. Slight chills are, however, often among the very first manifestations of indisposition—at first, they alternate, with flushes of heat, which latter gradually increase in duration until they predominate wholly, and the febrile reaction is fully developed. When the fever is once completely established, the pains in the head, back, and lower extremities, become greatly aggravated. These pains, especially those seated in the back and legs, are sometimes so severe, as to resemble in violence, those which occur in acute rheumatism. The eyes soon acquire an icterode or yellowish tinge; the tongue becomes covered with a brownish fur; nausea, and occasionally bilious vomiting occur; a sense of fulness and weight or tension is felt in the right hypochondrium, and epigastric regions; respiration is more or less oppressed and anxious; the urine is scanty and deeply tinged with bile; the pulse is full, frequent, but seldom very hard or tense, and the skin is generally dry and hot. These symptoms continue until the succeeding morning, when a gentle perspiration appears on the superior portions of the body, and sometimes over the whole surface. The febrile excitement now abates, frequently, very considerably; but not so as to amount to a state of apyrexia—the skin still remaining preternaturally warm, and the pulse irritated. This remission continues but a short time—not more, commonly, than from one to two hours. The febrile excitement rises again with more or less celerity,

until it acquires its former violence, or, perhaps, exceeds it; which, after a certain period, again abates, and gives place to another *remission*. In this way the fever proceeds, undergoing regular revolutions of exacerbations and remissions, until it either finally terminates in a perfect crisis and convalescence, or assumes a more uniform or continued course. This description answers for the simple and usual form of the disease, as it occurs in the autumnal months of the temperate latitudes; or, for the milder remittents of the warmer climates. There is, however, no form of fever which is subject to so great a diversity, in relation to its grade of violence, as the present one. In the intertropical regions, it usually assumes the most fatal and violent character; and at almost every place where it is endemial, it is attended with circumstances which give it a somewhat peculiar character. It is, indeed, impossible to give any description of this disease, which can have more than a very general application. We must content ourselves with a delineation of the prominent and characteristic outlines of its physiognomy, (if I may be allowed the expression;) and with a detail of those phenomena and circumstances, which may be deemed essential, and which have a particular bearing upon its remediate management.

The ordinary mild remittents of this climate, generally assume the double tertian or quotidian type; but the former type is, by far the most common; for, although the axacerbations occur once every day, yet, we almost always find a very manifest aggravation of all the symptoms on the odd or alternate days. The exacerbations of a remittent of the quotidian type generally occur several hours earlier than of those of the double tertian type —the former happening usually about nine or ten o'clock, and the latter not till towards noon, or an hour or two later.

The remissions which so generally occur in the violence of the symptoms of this form of miasmal disease, are not, however, always so considerable as to be readily perceived, either by the patient or the physician; and, in some instances of an aggravated character, they may be, for a time, altogether inconspicuous or absent. It must be observed, moreover, that they do not invariably occur in the morning or forenoon; on the contrary, instances are met with where the remissions take place in the evening or at some period during the night.

Remittents, although mild and regular in their commencement, are apt to assume an aggravated and dangerous character, if they continue unchecked beyond the ninth day, or second week. When this happens, the tongue becomes more and more loaded with a brown fur, and dry along the middle; delirium occurs more frequently and strongly; the skin acquires a deeper tinge of yellow, and a greater intensity of heat during the exacerbation; debility becomes more and more conspicuous, and

the bowels distended with flatus, and tender to external pressure; and, finally, in many cases, watery and offensive discharges from the bowels, retention of urine, continued vigilance, restlessness, and almost constant delirium.

In the paludal districts of hot climates, remittents rarely occur in the mild and simple form which they are wont to assume in the temperate latitudes. They generally acquire a highly aggravated and dangerous character; and under circumstances particularly favourable to their occurrence, they are apt to assume a high degree of malignity from their very commencement. Remittents of this violent grade generally make their attacks suddenly, and with great impetuosity. The cold stage is short, and not often very severe. The febrile heat soon predominates and rises rapidly to a state of great intensity—and is attended with tormenting thirst, violent headach, excruciating pains in the loins and the inferior extremities, great anxiety of feeling and difficulty of breathing, with nausea, and a distressing sense of weight and fulness in the stomach. These symptoms continue for about twenty-four hours, when a remission, always very considerable, and frequently amounting almost to a perfect *intermission*, takes place. This calm, however, is but transient. A second paroxysm soon ensues, more violent and alarming than the first. The eyes now become yellow, watery, and red; the oppression and anxiety in the epigastrium is extremely distressing, and a deadly sickness, with constant vomiting or retching, torments the patient. After the lapse of some time, these violent symptoms again abate, and a clammy perspiration appears on the surface of the body. During the two first paroxysms, the bowels are, generally, torpid. In this way, the paroxysms continue to recur, until either a salutary crisis or death takes place, one or the other of which not unfrequently happens in the third paroxysm. If the disease runs on beyond the fifth or sixth paroxysm, very great prostration ensues; the remissions become less distinct; delirium almost constantly attends; and the skin acquires either that peculiar stinging heat, called *calor mordax*, or becomes cool and cadaverous to the touch. The pulse, in cases of this kind, frequently differs but little from its natural state; more commonly, however, it becomes quick, irregular, and frequent. In this aggravated and protracted state of the disease, various other symptoms usually occur, in addition to those already mentioned, indicative of the fatal malignity of the malady. The lips become swollen, and of a livid or purple hue; the tongue dark-brown, or black—fetid and clammy; the eyes red and watery, or quite dry; the urine dark-brown, offensive, or entirely suppressed; the alvine discharges reddish and watery, or black, bloody, or colliquative, attended generally with a

tympanitic state of the abdomen ; and petechia and hæmorrhages occasionally occur in the last stage of the disease.

In general, the violence of the disease will be in proportion to the suddenness and vehemence of the incursion. When the attack approaches gradually, with the ordinary premonitory symptoms mentioned above, the disease usually runs its course slowly. When, on the contrary, the invasion is sudden and violent, we may expect the disease to be rapid and violent in its progress. The *first* paroxysm only is usually ushered in by a very distinct cold stage—the succeeding exacerbations being rarely preceded by a sense of chilliness.

Between the mildest variety of the disease, and the rapid, vehement and fatal variety just described, this form of fever appears under the greatest diversity of grades, and general character. Remitting, like all other forms of general fever, is liable to become complicated, either at an early or late period of its course, with local inflammations; and these secondary local affections constitute the chief and most important cause of those remarkable diversities which are known to occur in this disease, in different localities, or at the same place in different seasons. From some inexplicable circumstance, connected, apparently, with the peculiar concentration or character of the miasmata, we find that in certain localities and seasons the disease manifests a peculiar tendency to fall, with especial violence, on some one organ or structure, as the brain, the liver, the alimentary canal, or the blood vessels, and to assume, in consequence, a peculiar character in relation to its general phenomena and degree of fatality.

In general, however, two important organs—the *liver* and the *alimentary canal*, are the parts most *apt to become* prominently affected in fevers of this kind. In relation to these affections, two distinct modifications of the disease occur ; one, in which the phenomena of *gastro-enteric* disorder are especially prominent ; and another modification, in which predominant *hepatic* derangement impresses its peculiar stamp or character on the disease. To the former, the term *gastric*, and to the latter that of *hepatic*, might, not unaptly, be applied.

The remittents of the former variety, namely, *gastric* remittents, are characterized by the following phenomena, viz : redundancy of vitiated bile in the stomach and bowels ; a bitter taste ; a thick yellowish layer of mucus on the tongue, becoming dry, cracked, and of a dark-brown or black colour in the progress of the disease ; total loss of appetite, and sometimes extreme disgust for every kind of food ; a turbid, yellowish, or jumentose urine ; great weight and anxiety in the præcordia ; bowels tender on external pressure, and distended with flatus ; great pain in the loins and knees ; intense pain in the forehead ; very

distinct remissions ; a red or fiery edge and tip of the tongue ; or after the brown or black crust scales off, a smooth, shining, and red surface of the tongue ; watery and reddish stools ; resembling the washings of flesh ; retention of the urine ; difficulty of swallowing liquids in the advanced stage : great craving for cool and acidulated drinks, &c.

Those remittents which manifest predominant *hepatic* disorder, that is, *hepatic* remittents, are characterized by intense febrile heat ; violent pains in the head, and early delirium ; fulness and tension in the right hypochondrium, with pain and pulsation in the epigastrium and right hypochondrium ; a *clean* tongue, at first ; excessive irritability of the stomach ; frequent and forcible vomiting, *without the ejection of any bile, the matter brought up consisting of a glairy fluid*, mixed with the drinks that may have been received into the stomach ; great torpor of the bowels ; a very yellow tinge of the skin ; and tunica albuginia ; and *towards the termination* of the disease, a *copious* discharge from the bowels of a dark or pitch-like matter. In this variety of the disease, the liver is manifestly inactive, and in a state of great sanguineous congestion. That this is the case, may be inferred from the absence of *bile* in the ejections from the stomach ; the clean tongue : the sense of weight, fulness, and pulsation in the right hypochondrium ; the great torpor of the bowels ; the intensely yellow colour of the skin ; and *the excessive and continued retching and vomiting.* This latter symptom, namely, extreme *irritability of the stomach*, may be regarded as a strong manifestation of *sanguineous engorgement* and *functional inactivity of the liver.* We find this pathological fact exemplified in *cholera*, particularly in cholera infantum, in which disease there is seldom any bile whatever discharged during its early period ; and the appearance of this secretion in the discharges may be hailed as a very favourable occurrence. Towards the conclusion of this variety of remittent fever, the liver frequently recovers its action and relieves itself by pouring a large quantity of black bile, or perhaps blood, into the bowels as is manifested, by the copious, dark-coloured or tar like alvine discharges, which usually occur in such cases. These large and very peculiar discharges, may indeed be regarded as the favourable *crises* of such fevers ; for convalescence generally soon follows their appearance, and except the disease be arrested by remediate treatment in the early period of its course, there are but few recoveries in which such discharges do not occur. Dr. Cartwright describes an epidemic fever, which prevailed in Monroe county, Mississippi, in the autumn of 1822, which was strikingly marked by the characteristic phenomena of this variety of fever. "The disease," he says, "was generally ushered in by a distinct chill, which was speedily followed

by intense heat, thirst, and headach, and very severe pains in the loins. The anxiety and difficulty of breathing, the deadly sickness, sense of weight, heaviness, and pain in the stomach, increased as the fever approached its acme, until the suffering became intolerable. The exacerbations generally occurred in the evening, and a considerable remission, amounting in some cases to a perfect intermission, took place on the ensuing morning. On the evening of the second day a sudden and unexpected paroxysm, more violent than the first one, came on, which was attended with a most horrid sensation of pain and oppression of the stomach, accompanied with deadly sickness and continued vomiting, *but with the ejection of very little fluid of any kind.* The bowels during the first and second paroxysms were always in a state of obstinate constipation. About noon of the third day the third paroxysm generally came on. During this paroxysm the skin usually felt rather cooler than natural, and the pulse was commonly remarkably slow. By placing the hand on the abdomen, a pulsation was felt equal to that which the heart produces in the thorax, and synchronous with the pulsations of that organ." During the first two paroxysms the tongue was but little furred; but in the third it assumed a much worse appearance, having a dark red line running from its extremity over its dorsum, which soon changed to a black colour. The skin began to acquire a yellow colour during the third paroxysm. The paroxysms continued to recur until the fifth, seventh, or ninth day, when either death took place, or "enormous dark-coloured evacuations from the bowels occurred, and the patient commenced to convalesce."*

Although the symptoms just mentioned clearly indicate very prominent disorder of the liver, it is equally evident, that in these cases, the mucous membrane of the stomach and bowels is always perhaps, in a state of considerable irritation, and probably often of inflammation. Nevertheless, it can scarcely be doubted that the peculiar phenomena of this variety of the disease, and which distinguish it from other modifications of remitting fever, depend mainly on certain morbid conditions of the biliary organs, and which do not occur to the same extent in other varieties of the disease. More or less derangement of the biliary system, appears, indeed, to be a universal attendant on remitting fever. The tendency of miasmata to act upon and disorder the liver, has already been particularly mentioned; and it may be presumed from this circumstance, independent of the phenomena of the disease, that prominent functional disorder of the liver, constitutes one of the most constant local affections of remitting fever.

Before I leave this part of the present subject, it may be useful

* Medical Recorder, vol. vi.

to advert again to the former or *gastric* modification of this disease, and to direct the attention of the reader more particularly to the great tendency there exists in remittents, when they are prolonged in their course, to the occurrence of a high grade of irritation or subacute inflammation of the mucous membrane of the intestinal canal. In most cases of protracted remittents, even of the mildest kinds, the abdomen becomes somewhat tympanitic, and tender to external pressure; and the character of the stools, which are often found to resemble the washings of flesh, are a further evidence of such a condition of the bowels. In a practical point of view, it is of the utmost consequence to be aware of this circumstance; for in many instances this secondary inflammation is excited by the too frequent employment of irritating purgatives, and the disease greatly aggravated and protracted by such a course of treatment.

In localities where miasmata are copiously generated, or possess great virulency, remitting fever sometimes comes on under symptoms of cerebral disorder, simulating apoplexy or mental derangement. In Italy, and the intertropical countries, the disease, not unfrequently, makes its attack under one or the other of these cerebral affections. Sudden and furious mania is sometimes among the first manifestations of the disease; and many patients sink, at once, into a state of insensibility and apoplectic oppression, from the vehement action of the miasmata on the brain. The brain, however, is not so apt to suffer inflammation in this form of fever, as in those which are the product of *idio-miasmata*, contagion, or atmospheric vicissitudes. This, at least, may be affirmed of the ordinary remittents of the middle latitudes; and it is probably generally correct in reference to all malarious fevers. Nevertheless, when the mucous membrane of the alimentary canal becomes inflamed, the brain usually manifests strong sympathetic irritation, by more or less violent delirium of nearly uninterrupted continuance. It is, perhaps, on this account, namely: the comparative infrequency of cerebral inflammation in remittents, that we do not so often observe that sudden and remarkable collapse of the vital energies in this disease, as in the fevers produced by other causes.

The ordinary remittents of the temperate latitudes often terminate in intermitting fever before the final disappearance of the disease; and it is not uncommon for the milder varieties of the disease to assume the intermittent form at an early period of their course. This conversion of form appears to be particularly favoured by blood-letting practised during the first few days of the fever. Remittents also, frequently terminate in other affections; such as neuralgia; chorea; paralysis; diminution of the powers of intellect; organic disorder of the liver and spleen; dropsy; pain and swelling of the large joints, &c.

Causes.—After what has been already said under the heads of *koino-miasmata* and intermitting fever, in relation to this subject it will be sufficient to observe, that besides *koino-miasmata*, which are unquestionably the sole epidemic source of this form of fever, there are a variety of other causes capable of producing this malady. Worms and other irritating substances lodged in the bowels, may give rise to a regularly remitting form of fever. The disease known under the term of "infantile remittent," appears to arise from intestinal irritation. In the remitting fevers produced by causes of this kind, however, the biliary organs are much less apt to become implicated than they almost invariably are in the miasmatic remittents. Whatever may be the remote cause of remitting fever, however, it seems very evident that the principal morbid irritation is always located in the abdominal organs, and more especially in the liver and mucous membrane of the alimentary canal. So unequivocal and universal is this gastric disorder or irritation, that some eminent physicians have, in consequence of it, designated the disease by the name of *gastric fever*. (Richter.)

Indeed, this term appears to me preferable to that of *remittent*, which has no reference to the pathological condition of the system, and might, with equal propriety, be applied to hectic fever, which, though very distinct from remitting fever, has remissions and exacerbations almost as conspicuous and regular as that disease.

Treatment. The principal indications to be fulfilled in the treatment of remitting fever are: 1, to moderate the febrile reaction of the arterial system; 2, to remove out of the alimentary canal the vitiated and irritating secretions which may be lodged in it; and 3, to obviate gestro-intestinal irritation, and restore the healthy functions of the liver, and alimentary tube. I shall speak in the first place of the treatment proper in the milder or gastric variety of the disease.

With regard to the first of these indications, very discrepant sentiments have been expressed as to the particular means best calculated for its fulfilment. Some recommend a prompt and free employment of the lancet as decidedly beneficial in the treatment of remittents, whilst others admit its *occasional* utility, and others, again, represent it as frequently injurious, and rarely beneficial. In the ordinary autumnal intermittents of this climate, blood-letting, I am well satisfied, may be often, very properly, entirely omitted. The pulse in the milder cases of this disease, particularly where the intestinal canal is loaded with bilious and other saburral matter, is not often sufficiently hard and tense to warrant copious or repeated abstractions of blood. In such cases, when unaccompanied by symptoms of strong local congestions or visceral inflammation, I have found it necessary

to draw blood. There can be no doubt, however, that in particular localities, and under peculiar circumstances of atmospheric constitution and vicissitudes, remitting fevers may sometimes assume a character which demands the free use of the lancet. To condemn the use of the lancet universally, would be as erroneous as to enjoin its invariable employment. Bleeding cannot be employed or withheld, merely on the ground that we are prescribing for a *particular* disease. In all maladies, the state of the pulse must be our main guide, in relation to the use of the lancet. When the pulse is either *hard* or *tense*, whether it be full or contracted, blood may be safely, advantageously drawn, whatever may be the name, or the general character of the disease.

In cases that are attended with violent pains in the head—a full, vigorous, and hard pulse, with a very hot and dry skin, bleeding is, unquestionably, decidedly indicated, and ought not to be neglected. Having moderated the momentum of the circulation by venesection, where this measure is indicated, the attention should next be directed to the alimentary canal. Considerable discrepancy of opinion has been expressed, in relation to the employment of *emetics* in the treatment of remitting fever. In the ordinary autumnal remittents of the temperate climates, gentle emetics will often afford some advantage; but their usefulness is, probably, much too highly estimated, by the majority of those who are in the habit of employing them in this disease. I have of late years but rarely resorted to them in this form of fever, and I am inclined to think, that they may be generally well dispensed with, without losing any peculiar remediate advantages. There exists a decided tendency to gastro-intestinal irritation in every modification of this disease; and, although the operation of an emetic may procure temporary benefit, yet some risk will be incurred of its exciting a degree of permanent irritation, which will subsequently exercise a most pernicious influence upon the phenomena and progress of the disease. In the year 1822, I attended a considerable number of patients labouring under the milder form of remitting fever. During the early part of the season, I prescribed an emetic in the majority of cases that came under my care. In many of these cases, a great degree of gastric irritability continued to prevail during the first period of the malady, and in the advanced stages, much tenderness and tympanitic tumefaction of the abdomen supervened. The disease, in these instances, was wont to run a tedious course—the abdomen became sore to pressure, and the alvine discharges often became watery, reddish, and painful—in short, unequivocal manifestations of high irritation or phlogosis of the intestinal mucous membrane often supervened. Towards the middle period of the season I left off employing emetics entirely,

and, with the exception of one or two brisk cathartics, in the commencement, confined myself to the use of the milder laxatives, to keep up the requisite discharges from the bowels. From this time on, I met with but few cases in which the former unfavourable symptoms occurred. It must be confessed, however, that there are very respectable authorities to be adduced in favour of the use of *emetics*, not only in the *mild*, but even in the more *rapid* and *violent* varieties of this form of fever. Whatever doubts may be entertained in relation to the usefulness of emetics in the ordinary forms of remitting fever, the weight of good testimony is, however, decidedly against their employment in those violent grades of the disease which occur in the *hot* climates, and in which there generally exists the utmost degree of gastric irritability. That emetics may *sometimes* be administered without detriment, and even with benefit in these high and dangerous varieties of the disease, may be admitted; but it is most obvious, that no small degree of danger must be incurred from the impressions of such a remedy upon the delicate and already irritated or highly irritable mucous membrane of the stomach. The foregoing observations apply with still greater propriety to the employment of what are termed *emeto-cathartics*. Chisholm speaks favourably of their employment; but there have been, comparatively, few practitioners who appear to have found them peculiarly beneficial. I do not doubt, that in the milder cases, the conjoined operation of an emetic and a purge will occasionally make a decidedly favourable impression on the disease; but I am equally well satisfied, that much injury will sometimes result from the irritation which they are calculated to produce.

Whatever may be thought of the propriety of administering *emetics* or *emeto-cathartics* in this disease, almost universal experience speaks decidedly in favour of the employment of purgatives, not only in the beginning, but at proper intervals throughout the whole course of the disease. In all instances where the irritability of the stomach does not forbid the administration of a purge, the bowels should be early and thoroughly evacuated by a suitable purgative. A combination of calomel and jalap, in the proportion of 10 grains of each, will, in general, suffice to procure adequate evacuations. Having emptied the bowels well, by a brisk cathartic in the onset of the disease, recourse must next be had to such remedies as are calculated to restore the healthy functions of the liver, alimentary canal, and the skin, and to moderate the general febrile excitement, and obviate or remove the local congestions or inflammations that may supervene.

To correct the morbid condition of the liver, skin, and alimentary canal, constitutes the chief part of the treatment of this

malady. For this purpose, the following combination will often answer extremely well:

℞. Pulv. nitrat. potassæ ʒj.
Pulv. ipecac.
Calomel āā gr. xii. M. ft. Divide into six equal parts.

One of these powders is to be taken every two or three hours. The substitution of the ipecacuanha for the usual ingredient, *tartar emetic*, will obviate the tendency of this mixture to irritate the bowels, and to cause frequent and griping watery stools —and which rarely fail to aggravate the violence of the disease. Calomel is a most important remedy in this form of fever. Its power of altering the morbid condition of the liver, and of the whole capillary system, together with its gentle aperient effects on the bowels, renders it peculiarly calculated to do good in this disease. To obtain these important advantages, the calomel should be early and regularly administered, and continued until slight manifestations of its specific influence on the system may be noticed in the gums. When this occurs, its use must be suspended. For more than fifteen years I have employed this remedy in nearly every case of remitting fever which has come under my management, where I have been called to the patient during the first two or three days of the disease. In a great majority of these cases, I found all the symptoms of the disease to abate, often very considerably, as soon as the mercurial influence became conspicuous; and in many instances, a speedy convalescence ensued. Although a very gentle mercurial impression is generally decidedly beneficial in this malady, yet strong mercurialization or ptyalism, appears to be generally detrimental— at least in the ordinary remittents of this climate. It is to be observed, moreover, that in the advanced periods of the disease, the constitutional operation of mercury will be much more apt to prove injurious than beneficial. In general, the salutary influence of mercury is restricted to the first five or six days of the disease; and the earlier its general operation can be procured, the more certainly will it prove advantageous.

When the above combination of calomel, nitre, and ipecacuanha excites active purging, as has sometimes been the case, we may not only lose the specific influence of the mercurial, but there is danger of superinducing inordinate irritation in the mucous membrane of the intestinal tube. Whenever frequent painful, and watery stools follow the exhibition of the above combination, the nitre ought to be left out, and ipecacuanha or small doses of Dover's powder added to the calomel. Throughout the whole course of this disease, a gentle and regular action of the bowels ought to be carefully promoted by mild laxatives; but, excepting in the very commencement, strong and irritating cathartics, especially when frequently administered, are frequently

prejudicial. There is no class of remedies which is more indispensable in the treatment of remitting fevers than laxatives; and yet, there are no medicinal agents which are so frequently abused, or improperly employed in this disease, as this very class of evacuants. Violent and irritating cathartics, when repeatedly administered in this form of fever, seldom fail to induce a state of irritation in the mucous membrane of the bowels, from which a train of distressing and dangerous consequences arise in the advanced stages of the malady, which are often of more serious import than the original disease itself. The thin, watery, muddy, reddish, and fœtid stools—the tympanitic and tender state of the abdomen—and the cerebral irritation which frequently occur in the latter period of the disease, are very often the results of the frequent use of active and irritating cathartics in its treatment. "There is one fault which a physician sometimes commits in the treatment of bilious remittent fevers, and that, too, for the most part, when he thinks he is doing right. I allude to the too long continuation of purgative medicines. He is apt to think that the impurities have been long fixed in the bowels, and, in order to cleanse his patient thoroughly, and to leave nothing noxious behind, he persists in the use of purgatives. What is worse, every appearance of these cases would seem to justify his suspicion of the existence of fixed impurities of long standing in the bowels, and confirms him in his design of at once, and for all, making a clean house. The longer he continues to give his purgatives, the fouler does the tongue become, and the more distressed the stomach; the symptoms, in short, of intestinal impurities become more and more conspicuous, whilst he continues to dilute and to evacuate, without reflecting or knowing that he is himself the cause of all the noxious matter in the intestines, by constantly irritating them with his purgatives, and keeping up an afflux of fluids to the internal or villous coat. The most healthy individual will get a foul tongue and lose his appetite, if he take neutral purgative salts for several days in succession."*

Although *frequent* and *harsh* purgation is generally decidedly detrimental in the treatment of this form of fever, yet the total *proscription* of *laxatives* from the list of remediate agents suitable for its cure, is no less calculated to favour injurious consequences. There is always an abundance of vitiated bile and other morbid secretions poured into the bowels in this disease; and the generation of acrid and irritating materials by putrefactive and fermentative decomposition in the bowels, soon adds greatly to these sources of intestinal irritation, if the bowels be not, from time to time, gently evacuated by laxatives. Mere purgative enemata and bland diluents are wholly inadequate to

* Medical and Surgical Observations, p. 120.

remove these permanent irritants from the bowels, or blunt their activity. The irritation which such intestinal impurities create, must be vastly more intense and protracted, than the trifling and transient irritation of a laxative administered for their expulsion. In the commencement of the fever we may employ one or two active purges, viz:

℞. P. Jalap. Calomel āā gr. xii.

Or,

℞. Extract. colocynth. comp. gr. xii.
Calomel gr. x.
M. Divide into four pills, to be taken at one dose.

Or,

℞. Calomel . . . . gr. x.—To be followed with one ounce of sulphate of soda, in three hours after the calomel is taken.

After the *first*, or, at most, the *second* thorough purgation, the mildest laxatives, assisted with acidulated diluents, ought alone to be employed for evacuating the bowels; such as the *Siedlitz powders;* small portions of *Epsom salts*, preceded by a few grains of calomel; *castor-oil*, with a few drops of laudanum; a mixture formed of magnesia, castor-oil, and lemon syrup, constitutes an elegant, pleasant, and gentle laxative, which I have often used with very excellent effects. It is made by mixing very intimately in a mortar an ounce of the oil with a drachm of carbonate of magnesia, and then adding and mixing with it, about an ounce of any of the usual syrups. Of this a large table-spoonful is to be taken every hour, until the bowels are moved. From two to three evacuations ought to be procured every twenty-four hours, during the whole course of the disease. Much of the treatment of fevers of this kind depends on the judicious management of purgatives. Circumstances may indeed occur, which will render the employment of an *active* purge peculiarly beneficial even in the latter periods of the disease. This is particularly apt to occur in those violent cases, in which the liver at last pours out large quantities of black bile, and which, if not speedily removed, may cause a prostration or oppression of the system by exciting a state of general nervous irritation. Along with the remedies already mentioned, some advantage may be obtained from the usual antiphlogistic diaphoretics—such as the effervescing saline mixture, the spiritus mindereri, and the free use of bland acidulated drinks. The following mixture will be found a decidedly useful remedy in cases attended with much restlessness, anxiety, and a hot and dry skin, where there is no particular determination to, or excitement of the brain, and the febrile reaction is not very violent.*

* Dr. Agnew on the late epidemic, intermittent, and remittent fever at Harrisburg. Vide Medical Recorder, vol. vi. p. 147.

℞. Liquor ammoniæ acetat. ℥vjj.
Spir. nit. dulc. ℥j.
Tinct. opii. acetat. gtt. 30.
M. ft. Of this a table-spoonful may be taken every three or four hours.

Nitre with small portions of tart. antimony, dissolved in a bland mucilaginous fluid, will, in general, assist considerably in reducing the febrile heat, and promoting diaphoresis. We may also employ a solution of the *muriate of ammonia*, with much advantage, according to the formula given at page 95 of this volume. Indeed, this article, administered in the manner directed by this formula, appears to me better calculated to do good in bilious remittents than nitre. It should be particularly observed, however, that both these remedies, more especially nitre, cannot be properly employed in cases attended with much gastric irritability, or gastro-enteric irritation.

When the skin is very hot and dry, during the exacerbations, the sufferings of the patient may be much alleviated by sponging the body with cool water, and suffering it to evaporate by the heat of the body.

The use of mild, cool and acidulated beverages, ought to be enjoined as an important item in the treatment of this disease. Independent of the effects which drinks of this kind have in blunting the acrimony of the fluids lodged in the alimentary canal, they usually exert a soothing antiphlogistic influence upon the system, and they may do much good, moreover, by supplying the intestinal absorbents with a fresh and wholesome fluid, and thereby preventing or lessening the absorption of irritating or vitiated matters from the bowels. Drinks made with lemon or citric acid and sugar, are, perhaps, the best diluents for this purpose. Barley-water, acidulated with lemon juice ; warm water poured on sliced apples, and afterwards suffered to cool,—fresh orange juice diluted with cool water, or currant jelly mixed with water, are grateful and salutary beverages.

When, either from the imprudent employment of *irritating* purges, or from other causes, the mucous membrane of the intestinal canal is brought into a state of high irritation or sub-acute inflammation, the disease generally loses its remittent form, and often assumes a low typhoid character, with almost constant delirium, a tender and tympanitic state of the abdomen, a dry, dark-brown, or black crust on the tongue, with clean red edges ; watery and reddish stools ; great prostration ; and a very dry and hot skin. Cases of this kind frequently run on for several weeks ; and convalescence is always very gradual and tedious. When the fever assumes this aspect, our remediate measures must be chiefly directed against the intestinal phlogosis. Leeching the abdomen will often afford much benefit ; and it ought never to be neglected where leeches can be had. A large emollient poultice will

assist, very materially, in reducing the intestinal affection. I am perfectly satisfied that we may, in general, derive much more good from applications of this kind than from blistering. Fomentations with flannel wrung out of hot water, will answer the same purpose ; but this mode of fomenting is much more troublesome and variable in its impressions, than the application of warmth and moisture by means of a poultice, and probably not more efficacious. Internally I have exhibited small doses of calomel and opium in such cases with manifest advantage. The one-sixth of a grain of the former with a quarter of a grain of the latter may be given every two or three hours. The bowels must be kept open by laxative *enemata*, and the patient requested to take freely of some bland mucilaginous fluids—such as barley water, very thin oat-meal gruel, or gum arabic dissolved in water. No other articles of food must be allowed, on any account. In such cases, I have thought that considerable benefit was derived from epispastics on the legs just above the ankles. This measure is particularly useful when the extremities are cool, while the skin of the body is hot—a circumstance which is not uncommon in instances of this kind. An emulsion of *balsam copaiva* also will frequently procure considerable advantage. I have so often seen the most decided benefit derived from this article, in protracted cases, attended with great irritation, or subacute inflammation of the bowels, that I should consider myself as neglecting an important curative means, were I to omit prescribing it in diseases of this character. It may be given thus :

℞. Bals. copaiv. ℥ss.
Sacch. albi. ℥ss.
Pulv. gum arab. ʒjj.
Misce. dein adde.
Aq. fontanæ ℥jj.
M. ft. Take a spoonful every two hours.

Although very considerable prostration often occurs in such cases, stimulants or tonics are by no means admissible, anterior to the period of convalescence.

Hitherto I have spoken only of the simple, or less violent variety of remitting fever—of those remittents which occur in the temperate latitudes, and which, though sometimes both violent and rapid in their progress, do not assume that high and dangerous grade of febrile action which is so common and so fatal in hot climates. In the higher and malignant forms of remitting fever, a treatment somewhat different from the one I have just detailed, is requisite. In these aggravated states of bilious remitting fever, the liver is deeply implicated, and the stomach is generally extremely irritable. Here, therefore, we cannot commence as we may in the simpler forms with emetics, or emeto-cathartics, and often not even with a purgative.

Instead of irritating the stomach by medicines of this kind, our first object, often, must be to allay the excessive gastric irritability, in order to enable the patient to retain the remedies which his case may demand. Among the means which experience has shown best calculated to effect this purpose, blood-letting holds, perhaps, the first rank, where the arterial reaction is vehement. To be beneficial in this respect, however, it must be early and copious. I have known excessive irritability of the stomach and retching promptly checked, in the onset of the disease, by one efficient bleeding. Sinapisms over the epigastrium will sometimes aid considerably to moderate the excessive gastric irritability, but applications of this kind cannot be generally used with propriety until the reaction of the heart and arteries has been, in some degree, moderated by venesection. A draught of cold water is not only extremely grateful, but, when the skin is hot and dry, often very beneficial in restraining excessive vomiting in cases of this kind. The saline effervescing draught, artificial mineral water, (carbonated water,) the warm bath, lime-water and sweet milk, spiritus mindereri, have all been recommended and used for this purpose. Sinapisms laid on the calves of the legs will sometimes speedily diminish the morbid irritability of the stomach, in cases of this kind.

I have just stated that blood-letting is one of the best, if not the *most* effectual means for allaying the extreme irritability of the stomach, which is apt to occur in the violent grades of this disease. This observation applies, however, to such cases only as are attended with high vascular reaction; for where the vital energies are prostrated, this evacuation is of course inadmissible. Having allayed the gastric irritability where it was excessive, our principal reliance must be placed in the judicious employment of *calomel*. The liver, in this violent grade of the disease, is generally congested, torpid, or otherwise deranged to a very great degree; and our remediate efforts must, therefore, be particularly directed to this viscus. Experience, indeed, has fully demonstrated the excellent effects of *calomel* in this affection. There are some practitioners, it is true, of great respectability, who do not approve of the free employment of mercury in this disease; but by far the largest proportion of those who have practised in warm climates—particularly of the American and British practitioners, have given their decided testimony in favour of the mercurial treatment of the higher grades of miasmal fevers. In no country in the world, perhaps, is calomel so freely employed in the treatment of this malady as in the southern sections of the United States. The almost unanimous testimony of our southern physicians (many of whom are deservedly held in high estimation for their talents and medical acquirements,) in favour of this practice, will scarcely permit

us to doubt of its general usefulness. The American practitioner, free from the trammels of systems, and the dogmas of the schools, pays no further regard to the *verba magistri* than is sanctioned by his own experience and observations. He inquires, observes, and reflects for himself, and adopts that mode of treatment which he finds, from varied experience, most successful. A practice, which has received the approbation of a numerous portion of the profession, may be confidently regarded as founded on individual experience and observation, and not adopted on mere authority, and entitled therefore to full confidence.

As it is of the utmost consequence to make an early and decided mercurial impression on the system, the calomel ought to be given in large and frequent doses. From ten to twenty grains should be administered every four or five hours, until the gums begin to show its influence, or until the evacuations become conspicuously bilious. While we thus endeavour to produce a general mercurial action, and especially to restore the regular functions of the biliary organs, the bowels should be kept freely moved by additional aperients, if the calomel do not produce this effect by itself. If the bowels are not freely evacuated by the two first doses of calomel, an additional purgative ought to be administered. For this purpose, an ounce of the sulphates of sodæ, or of magnesia; or from fifteen to twenty grains of the compound extract of colocynth; or a dose of calomel and jalap, will generally answer well. In general, however, very *active* purges will be less beneficial or proper than the milder ones. Indeed, so long as the liver remains inactive and engorged, it will rarely be advisable to repeat even the purgatives I have mentioned. After the first efficient mild purge, it will generally be much the best plan to keep the bowels open by laxative *enemata*, and the use of tamarind water, or the Seidlitz powders, if these can be had. When the liver begins to act and to pour its dark bile into the bowels, however, laxatives of a more active character become indispensable. In cases attended with a distressing sense of sickness, accompanied with soreness in the epigastrium, leeching, succeeded by a large blister over this region, will often afford much relief. Experience does not, however, offer much in favour of the employment of blisters as a general remedy, either in this or the more mild variety of the disease.

Little or no advantage is to be obtained from the ordinary diaphoretic remedies in the higher grades of the disease. *Nitre*, indeed, and the antimonial preparations are wholly out of the question where there is much gastric irritability. Where the stomach will bear it, *James's powder*, in small doses, with calomel, may often be advantageously employed. The saline effervescing draught, and the spiritus mindereri, will also sometimes

aid in allaying the sickness of the stomach, and relaxing the torpor of the cutaneous exhalents. In all instances, perhaps, the enjoyment of cool acidulated drinks—such as lemonade, thin barley water, with a little fresh lemon juice, ought to be freely allowed. Tamarind water also is an excellent beverage in cases of this kind, on account particularly of its aperient properties. Drinks of this kind tend to moderate the intense febrile heat, and they do good, moreover, by diluting and obtunding the acrimony of the vitiated fluids, which are almost continually generated in the alimentary canal.

The propriety of employing tonics during the remissions of the disease is a point which has been very variously represented by different writers. Lind, Clark, Balfour, and a host of others contend zealously for the vigorous exhibition of bark as soon as a considerable remission occurs in the disease. Dr. James Johnson, on the contrary, with a number of other late writers on this disease, condemns this practice in terms of unqualified reprobation. Dr. Burnet, in his Essay on the Bilious Remittents along the Mediterranean, asserts that under "the use of the cinchona, the mortality has been great; relapses frequent; and the supervention of dysentery manifestly more frequent." I presume that the *cinchona* may be injurious, or beneficial, according to the period of the disease, or the circumstances under which it is administered. Where there are no violent visceral congestions—where the liver has resumed its regular action, and where, with these favourable circumstances the remission is complete, the bark or the quinine in *large doses* will often do a great deal of good. The authority of many of the most respectable of our southern brethren might be cited in confirmation of this remark. There can be no question however, that so long as the liver remains torpid and engorged, or where strong local congestions, inflammations, or irritation are present, the bark will not only be useless, but generally decidedly injurious. No matter how slow and soft the pulse may be, so long as the abdomen remains tender to pressure, the tongue and skin dry, and the alvine discharges free from bile, bark and all other tonics are contra-indicated, and cannot be resorted to without great risk of irreparable injury. When, on the other hand, the occurrence of a remission is attended with a soft and moist skin and tongue, signs of bile in the stools, and freedom from abdominal tenderness, the quinine will, in general, prove highly beneficial.

The affusion of cold water has been highly extolled by some, in the treatment of this disease. It does not appear, however, that this measure is calculated to do any good in the more violent grades of bilious remittents, where strong congestions and derangements of the biliary organs are present, or where the bowels are loaded with bilious and other saburral matter. (Richter.)

Where these objections to its use do not exist, and the skin is very hot and dry, and violent pain in the head, with delirium, is present, cold water thrown on the patient will often produce prompt and manifest abatement of the febrile symptoms. It is, notwithstanding, a good general rule to delay the cold affusions until evacuations both by venesection and by the bowels have been premised; and above all, they must never be used unless the skin be dry and above the natural temperature.

During the period of convalescence, mild tonics—such as infusions of cinchona, gentian, columbo, or serpentaria, will generally assist in restoring the tone of the digestive organs. The bowels must not be suffered to remain constipated; and the diet should be simple, mild, and digestible—such as animal broths, rice, barley, a little boiled or broiled mutton, lamb, or tender beef.

CHAPTER VI.

YELLOW FEVER.

Synonymes.—Typhus Icterodes; Maladie de Siam; Bulam Fever; Vomitus Prieto; Causus.

Yellow fever has been the theme of interminable discussion and controversy—a theme which has drawn forth the best and the worst feeling of the human heart—which has furnished motives, on the one hand, for the most active exertions of philanthropy and self-devotedness, and on the other, for all the bitterness and uncharitableness of feeling, which man, in his most degraded moments, is capable of manifesting.

There is no form of fever more variable in the violence and character of its symptoms than the present one. In the seasoned and acclimated inhabitants of those regions where the disease is endemic, it is often as mild as ordinary bilious fever. But in the young and robust, who have not yet been seasoned to the climate, it seldom fails to make its attack with an overwhelming force; commencing and terminating in death, often within forty-eight hours, and sometimes sooner.

The disease usually begins with a sudden feeling of giddiness, pain in the back, loins, and extremities, faintness and debility, with slight creeping chills, and nausea. After a period varying from a few to twelve hours, these symptoms are succeeded by a sudden development of vehement arterial reaction, accompanied

with a dry and intensely hot skin, flushed face, red eyes, extreme headach, tormenting thirst, intolerance of light, pain in the loins and lower extremities, a sensation of weight and tension at the stomach, white, and sometimes clean tongue. Towards the end of the first twenty hours of the fever, the patient begins to vomit frequently, particularly after taking drinks. The ejections consist, at first, of such fluids, only, as may have been taken into the stomach; but after these have been thrown off, bile, often in abundance, is brought up, varying in colour from pale yellow to dark green, and frequently so acid as to excoriate the fauces and lips. The heat and tenderness in the epigastrium now increase, the countenance assumes an indescribable expression of distress and hopelessness; there is great restlessness and sighing, and more or less delirium, usually, supervenes. In some cases slight pain is experienced on swallowing; "and about this time an urgent sensation of hunger often comes on, and a remarkable want of power in the lower extremities, resembling partial paralysis." This paroxysm lasts, commonly from twenty-four to thirty-six hours, but in some instances, considerably longer; and then all the symptoms, with the exception of the nausea and the vomiting, greatly abate—the pulse returning to its natural standard, and the skin acquiring a moist and temperate condition. So complete, indeed, is the remission in some cases, that the patient is induced to flatter himself that all danger is now passed. More commonly, however, the patient remains in a state of tranquil indifference, amounting to a sort of stupor, without any apparent concern as to present or future situation. This is an ominous calm; for after a few hours, the pain and burning sensation in the stomach return with increased violence; the vomiting becomes frequent and distressing—the fluid brought up containing minute flakes or flocculi, resembling the crust washed from a port-wine bottle, but little or no bilious matter. The desire for cool drinks is extremely urgent, but every thing which is swallowed is immediately rejected by the stomach, with great force. The eyes and skin about the neck and breast, now acquire a yellow hue. This second paroxysm continues, commonly, from twelve to thirty-six hours, and is succeeded by a new train of symptoms, which mark the last or third stage of the complaint. The pulse now sinks in frequency, force, and volume; the tongue is dark-brown or black; the vomiting becomes almost incessant, and exceedingly forcible—the matter thrown up consisting of a black ropy fluid, resembling coffee-grounds suspended in a glairy liquid. The extremities become clammy and cold; and the acrid or burning sensation in the stomach, acquires a most distressing degree of violence. Diarrhœa usually occurs at this period—the discharges being green or black; "and the patient often complains of being unable to pass his stools, from a want of power in the

abdominal muscles." By this time the whole surface of the body is of a dirty yellow colour ; and hiccough, hæmorrhages, violent delirium, coma, insensibility, or convulsions, sooner or later terminate the patient's sufferings in death.

Such is the ordinary course of this fatal malady. In many instances, however, the attack is much more overwhelming ; the patient being seized at once with loss of muscular power, and general oppression of the nervous system,—falling down as if stunned with a blow. In other instances, violent and furious delirium, or mania ushers in the disease, terminating in a few hours in insensibility and convulsions. Sometimes the disease commences and proceeds to a fatal termination in so insidious a manner, that the patient himself and those about him are scarcely aware that he is much indisposed. In such cases there is, however, always a remarkable change in the expression of the patient's countenance, as well as in his usual temper and habits. In almost all instances of this disease, the countenance is expressive of intense anxiety and despair during its early period, and of gloomy or sullen abandonment in the last stage.

The period at which the skin begins to assume a yellow colour, is very variable. It sometimes occurs within the first forty-eight hours, and sometimes not until the fourth or fifth day. Various opinions have been expressed with regard to the immediate cause of this yellow hue of the surface. Some ascribe it to the serum rendered yellow by dissolved red globules of the blood, and effused under the cuticle. Dr. Fordyce attributes it to the superabundant secretion of sebaceous matter by the glands of the skin; and Dr. Saunders supposed it to depend on a peculiar state of the lymph in the subcutaneous cellular tissue. Many however maintain, and with correctness, I think, that the yellow hue, in question, is of an icteric character, depending entirely on the deposition of bilious matter under the cuticle.

The black matter thrown from the stomach in the latter period of this disease, does not consist of bile, as was once generally supposed, but of minute flakes of coagulated blood suspended in the gastric mucus, produced by sanguineous exhalation from the abraded surface of the mucous membrane of the stomach. The black matter discharged in some of the higher grades of bilious and typhus fevers differs essentially from the "black vomit" of yellow fever. The former will dissolve in water, and communicate a deep bilious tinge to it ; whereas the black matter which forms the *black vomit* of the present disease, consists of small insoluble flakes, which are held suspended in a viscid fluid, and will not communicate a yellow or greenish tinge to water when agitated with it. "In taste also they differ. The black matter which occurs in common bilious fever is always intensely bit-

ter; but that which is thrown up in yellow fever, is either insipid or acid."* (Bancroft.)

Post mortem appearances.—The stomach and liver are the organs upon which the disease exerts its principal force. The former, especially, always shows the strongest marks of previous inflammation and its consequences. Its coats are often thickened, and the mucous membrane is always strongly injected, abraded, and in many parts gangrenous, or totally disorganized. The duodenum and small intestines also almost invariably exhibit marks of inflammation. In many of the more aggravated cases, the liver undergoes much structural derangement. Dr. Chisholm has found the liver "in a dissolved or putrid state or sphacelated, and of the consistence, feel, and colour of rotten cork, or full of abscesses." Dr. Physick rarely found the liver much diseased, but the stomach was always inflamed and gangrenous in parts.†

Cause.—In relation to the origin and mode of dissemination of yellow fever, physicians have been at great variance; and the subject is still much disputed, although the weight of good testimony is greatly on the side of its miasmatic or domestic origin. After an attentive examination of the principal observations which have been published on this subject, it appears, indeed, difficult to adopt any other opinion, than that which alleges its origin from miasmatic effluvia, "exhaled from masses of public filth containing putrescent matter, generated under a high range of temperature." That this is the case, seems to be sufficiently demonstrated by the following circumstances:—1. Yellow fever always appears in the lowest and most filthy parts of towns; and those localities in which it is most prevalent, are in the immediate vicinity of marshes or soils favourable to the production of miasmata. 2. Yellow fever never occurs in cold seasons—a high range of atmospheric temperature being essential to the generation of its cause. 3. Heavy rains, storms, and the supervention of cold weather, never fail to put an immediate check to the disease.‡ 4. Yellow fever always appears simultaneously, and is intermixed with bilious remittents. Dr. Ramsay states, that in the yellow fever of Charleston, in 1804, "neglected

* Mr. Lyon, staff surgeon in the Island of Dominica, says that the black matter ejected from the stomach in yellow fever, is invariably very strongly acid. He ascribed the black colour of the blood to the action of muriatic acid on it; for it is this acid, which, according to the investigations of Prout and others, is secreted by the stomach in a state of disease. "Having made the experiment of adding muriatic acid to blood, the colour of the blood was instantly changed to a deep black, and when diluted with water, presented a liquid, which I should have declared, from mere inspection, to be black vomit."—Lond. Med. and Phys. Journ. 1829.

† New-York Medical Repository.

‡ Rush's Medical Inquiries.

intermittent frequently terminated in yellow fever." Dr. Rush also states, in relation to the yellow fever in this city in 1802, that "intermittents, the mild remittent, the inflammatory, bilious, and the malignant yellow fever, have, in many instances, all run into each other;"* and, he observes, that Dr. Saunders, nearly a century ago, noticed this conversion of marsh and yellow fever into each other. Yellow fever is, moreover, always most severe in the immediate vicinity of those localities which favour the generation of marsh miasmata. Dr. Caldwell speaking of the yellow fever of this city in 1803, says, "as the fever receded from the low ground and malignant atmosphere of *Water* street, it became more and more mild and manageable till its evanescent shades in Second street, were, in many instances, much lighter than the common remittent of the country." During the prevalence of the yellow fever in Baltimore, "the bilious or remitting fever in its ordinary form, prevailed in that town, and continued until it was gradually lost in the severer form of yellow fever as the season advanced." (Davidge.) 5. The miasmatic origin of the disease may be inferred also from the fact, that the recurrence of it has often been, in a great measure, prevented by removing the sources of pestiferous exhalations, in situations where it formely prevailed, almost annually, to an alarming extent. Our own city may be cited as a prominent example of the efficacy of cleanliness in preventing the occurrence of this disease. (Bancroft.) If these views be correct, in relation to the origin of the disease, we are forced to reject the opinion so stoutly maintained by some, of its being in any respect contagious. Indeed, if yellow fever did possess the power of generating its own virus, and communicating itself by contagion, the fact, as Dr. Bancroft observes, must have been proved ten thousand times by the most irrefragable testimony, and yet there is, perhaps, no *incontestible* case on record where the disease was thus communicated. The city hospitals established in the neighbourhood of this city and at New-York, furnish us with a striking refutation of the supposed contagious nature of this disease; for, in no instance, was the disease communicated to those who were employed about the sick. The same observations were made at the encampment near Baltimore, during the prevalence of this disease in that city in 1819. The recent very ample investigation of this subject by Dr. Chervin, has resulted in a mass of testimony, which can scarcely leave any pretext for doubting the non-contagious nature of this disease. But, although yellow fever be not contagious, it may, no doubt, be introduced into seaports in ships. Unquestionably, a pestiferous miasm may, under favourable circumstances, be generated in the holds

* Medical Repository for 1802.

of ships while navigating in hot climates ; which, when suffered to escape at the wharves, may give rise to the disease in question. When the miasmata are thus introduced, however, the disease engendered by it will not prevail epidemically, but only among those who approach the infected vessel, or the cargoes, and will disappear entirely when these are removed to a distance. (Bancroft.) The sporadic cases which occurred at the Wall, about 1804, at Perth-Amboy, in 1811, at Middletown, in Connecticut, in 1819, and at New-York, in 1824, were distinctly traced to vessels that had recently arrived from warm climates. The circumstances of the Ship Ten Brothers, at Boston, in 1819, afford a striking example of the production of deleterious miasm in the holds of ships, capable of producing yellow fever.* This vessel having arrived at Boston on the first of August, a number of persons went on board while the cargo was being discharged ; and out of these, twelve individuals, living in various parts of the city, were seized with malignant fever, nearly all of whom died. The disease was not, however, communicated to a single person of those who visited the sick.

Observations would seem to show, that those who have once suffered an attack of this disease, are afterwards, in a great degree, insusceptible of another attack. In hot climates, where the disease is endemic, persons recently arrived from more temperate latitudes, are almost exclusively obnoxious to this disease. The acclimated are, in a great degree, exempt from its attacks, and when it does occur in such individuals, it almost always is of a comparatively mild and tractable character. The influence of the remote cause of this form of fever is greatly promoted by intemperance, excessive exercise in the sun, exposure to a damp and cool night air, and, in short, by whatever is capable of debilitating either the whole system, or deranging important organic functions.

Treatment.—If yellow fever has been a fertile subject of dispute in relation to its pathology and cause, it has afforded no less scope for contention with regard to its remediate management. Whilst some strenuously recommend a prompt and energetic treatment; others condemning the lancet, mercury, and active purgation, advise nothing but the mildest and most soothing remedies. From a careful estimate of the best authorities on this head, however, it would appear that the chances of success are on the side of an energetic plan of treatment. This disease is highly phlogistic; and gastro-enteric inflammation is a very common occurrence—more especially in young, robust, and unacclimated subjects. In cases where the arterial reaction is vehement in the onset of the disease, general blood-letting

* Medical Recorder.

is often promptly and conspicuously beneficial. To obtain the full advantages which this evacuation is capable of affording, it must be early and very efficiently practised. Those who have employed blood-letting with the greatest success, are unanimous in restricting its use to the first stage of the disease. Dr. Robertson, in his account of the yellow fever of New-Orleans, states, that during the first twelve hours, he frequently drew from 50 to 60 ounces of blood;* and Dr. Belcher bled to the extent of from 50 to 80 ounces in the first stage, with much advantage.† In a disease so impetuous in its attack, and so apt to develop local inflammations, much, and often every thing depends on an early and powerful antiphlogistic impression on the system. Where the reaction of the heart and arteries is vigorous, the blood should be suffered to flow until fainting approaches, "for it is not only by unloading the vessels, but by the *shock* also which it gives to the system, that blood-letting proves so serviceable in inflammatory fevers." Dr. Anthony Musgrave states, that as soon as the febrile reaction was developed, after the invasion of the disease, he derived the greatest benefit from the immediate and rapid abstraction of blood, to an extent limited less by the quantity than by its decided effect upon the action of the heart and arteries.‡ Dr. Rush, as is well known to the profession of this country, was a zealous advocate for blood-letting in the disease. "I paid no regard," he says, "to the dissolved state of the blood, when it appeared on the first or second day of the disorder, but repeated the bleedings afterwards in every case when the pulse continued to indicate it." "In a disease like this," says Dr. Robertson, "where the danger is frequently imminent in twelve hours, it is often surprising to see how much its apparent character may be altered by active depletion." A host of other able practitioners might be cited in behalf of the usefulness of this practice. In those instances of the disease, however, where the nervous system appears to be in a manner overwhelmed by the remote cause of the fever; when the patient exhibits an air of confusion or intoxication, with great agitation, "and a dash of wildness gleaming at intervals over his agonized features;" when he complains of little or no headach, but is impatient and irritable, yet oppressed; and after the first days, sinks down with a careless expression of resignation—in such cases blood-letting is wholly inadmissible. Here we must rely chiefly on the prompt and liberal administration of *calomel* with a view to its salivant operation.

The efficient abstraction of blood in the commencement of the disease serves not only to break down the violence of the phlo-

* Johnson on Tropical Climates, vol. ii.
† Edinburgh Med. and Surg. Journal, 1825.
‡ Treatise on the Yellow Fever of Antigua.

gistic excitement, but often contributes materially towards allaying the excessive irritability of the stomach, frequently so distressing in this malady.

Purgatives also are highly useful remedies in this disease, though, like blood-letting, their good effects are almost entirely confined to the early periods of the disease. Calomel and jalap, in doses of 10 grains of each, was a favourite purgative with Dr. Rush. As calomel is, however, very generally admitted to be one of our most useful remedies in this disease, both on account of its purgative effects and its *specific constitutional* influence, it will be better to exhibit it by itself in doses of from 10 to 15 grains every three or four hours, and to promote its purgative operations by laxative enemata, after the second or third dose has been taken. In this way copious alvine discharges will generally be effected, and the system early brought under the mercurial influence. Should the bowels, however, not be sufficiently evacuated by these measures, a dose of Epsom or Glauber salts ought to be administered. When the bowels have been thus once freely evacuated, they must be kept in a loose state by means of the milder laxatives; such as Seidlitz powders; small portions of the saline purgatives, or the occasional use of enemata. It should be observed, however, that mercury, with a view to its constitutional operation, can seldom be serviceable, so long as the arterial action remains unsubdued in the commencement of the disease. Indeed, almost all attempts to produce ptyalism under such circumstances are fruitless. Decisive blood-letting in cases of this kind must be regarded as an essential preliminary to the use of mercurials. In cases of a less vehement grade of febrile reaction, where the disease assumes more of a congestive character, the *early* induction of salivation is particularly desirable—and our principal object should be to produce this effect as speedily as possible. Dr. Musgrave observes, "that in the more concentrated form of yellow fever, experience leads me to believe that mercury, administered with a view to its salivant effects, may be judiciously dispensed with. But there is a form of this disease which, from its insidious approach, is peculiarly calculated to lull the patient into mistaken security," and thus to baffle, in its subsequent progress, the best directed efforts; and this form is undoubtedly treated with great success by the rapid induction of ptyalism.*

In cases where the febrile reaction is strongly developed, the skin is always extremely hot and dry during the first period of the disease, and nothing is more refreshing than sponging or ablutions with cold water under such circumstances. Most writers prefer pouring it forcibly on the patient's body. Dr. Johnson

* Edinburgh Med. and Surg. Journal, 1827.

observes, that "the greater the force with which the water is applied, the more benefit will be derived from it."* When the head is much affected during the first stage, considerable benefit may be obtained from cold applications to the shaven scalp. Bladders partly filled with water, containing a lump of ice, is the most convenient and effectual mode of applying cold to the head. For the same purpose blisters are recommended by some, but their usefulness in this respect is very questionable, and certainly much inferior to the application of cold, so long as the arterial reaction is vehement. Draughts of cold water are generally very grateful to the patient, and have the effect often of moderating the heat, predisposing to perspiration, and of relieving the gastric distress. (Johnson.) Emetics are very generally, and with justice, condemned in the treatment of this disease. The gastric irritability and tendency to inflammation is so great in this affection, that mischief would almost inevitably result from the operations of this class of remedies. Nevertheless, we are told by Dr. M'Arthur, that where the disease commences with diarrhœa, or dysenteric symptoms, emetics may be frequently given with considerable advantage. Besides the means already mentioned for allaying the extreme irritability of the stomach, and restraining the vomiting so distressing in the disease, we may also derive much advantage from the application of leeches or blisters to the epigastrium, more especially after the impetus of the circulation has been in some degree moderated by an efficient bleeding. When the disease has passed on to the second period, we must depend on the use of mild aperients, diaphoretic and cooling beverages, enemata, cold affusions when the skin is hot and dry, and calomel, in reduced doses. A great deal, however, of the success of our remediate efforts depends on the proper management of the disease in the first period. As a diaphoretic, we may use the spiritus mindereri, or the saline effervescing draught. When, after the second exacerbation, the pulse and temperature sink, recourse should be had to the active tonics—and of these, the *cinchona* or quinine is the most efficient. The latter, especially, seems to have done much good in this disease.† These articles should be administered in as large and frequent doses as the stomach will bear. Dr. Musgrave resorted to the cinchona in the less vehement cases, with much good effect, as early as the first remission, having previously evacuated the bowels thoroughly. From five to ten grains of quinine may be given every hour or two during the remissions, and it may be given in conjunction with calomel, during the first periods of the disease.

* Influence of Tropical Climates, vol. ii. p. 182.

† Journal der ouslandishem Literature, &c. Von Drs. Julius and Gerson.

In the latter stage of the disease, the bark, quinine, wine, and ammonia, constitute almost the only remedies that can be employed with any prospect of advantage. Stimulants, however, are not so well calculated to do good in the sinking stage of this form of fever, as in that of typhus. The spirits of turpentine has also been recommended in the treatment of yellow fever, but it does not appear that its powers are sufficiently valuable in this respect to entitle it to much attention.

It is proper to state that many of the West India practitioners adopt a plan of treatment far less energetic than the one just detailed. They employ little else than mild aperients, with copious draughts of acidulated drinks, enemata, and external cold applications.

CHAPTER VII.

CONTINUED FEVER.

Although the varieties of fever which are arranged under the present general head are termed *continued*, in contradistinction to the forms of fever considered in the two preceding chapters, yet, with the exception of the *ephemera*, a fever strictly *continuous* or unremitting in its course, is in reality a phenomenon of the rarest occurrence. Whether the operations of the animal economy be carried on in a state of health or of disease, regular periodical fluctuations appear constantly to obtain in the excitement or actions of the system. In every form and variety of fever, there seems to exist a natural tendency in the general morbid excitement or symptoms, to remit or abate in their violence at some period during the day; and this remission, in perhaps ninety-nine cases out of a hundred, occurs during the morning. In the fevers denominated continued, however, these temporary abatements in the violence of the symptoms are generally slight, and frequently very transient; they usually occur very early in the morning, and seem to be the result of the abstraction of the stimulus of light, sound, &c. during the night, in conjunction with the natural tendency of the actions of the system to abate at this period.

Continued fever occurs under a variety of prominent modifications; and under every grade of febrile excitement, from the feeble and sinking reaction of typhus, to the vehement and tumultuous actions of synochal fever. Agreeably to this circumstance, it has been customary to divide continued fevers into *sthenic*

and *asthenic*, or *inflammatory* and *typhus*. That there exists a very material difference between the low fevers denominated typhus, and those usually termed inflammatory, is quite obvious. The term inflammatory, nevertheless, does not seem to be strictly appropriate as a *distinctive* appellative in this place; for that irritated excitement which constitutes fever is always necessarily inflammatory in its general character, whether the reaction be feeble and sinking, or vigorous and ardent. Mere grade of energy or activity, is to be regarded as an accidental and variable quality of inflammatory excitement. Fever consists essentially of an irritated action of the sanguiferous system, and this irritated condition may be connected either with *increased* or *decreased* energy of the vital powers. In pure synocha, the heart and arteries are in a state of morbid action, with *increased* powers of acting; whilst in typhus fevers the general irritated excitement is connected with fundamental *debility* of the vital powers. In either case, however, the irritated vascular action is essentially phlogistic, and equally prone to give rise to local inflammations. The diversities which occur in the general character of continued fevers, depend mainly on the differences which occur in relation to the degree of vital energy enjoyed by the system, and this diversity in the general energies of the system itself, would seem to depend on the greater or less degree in which the nervous system becomes implicated in the disease. The brain is the fountain whence the animal economy draws its powers of action; and whenever this source of the vital forces becomes injured or impeded in its operations, debility, corresponding to the degree and character of the cerebral affection, will be manifested in the actions of the system. In the high and vigorous synochal fevers, there are rarely any considerable manifestations of cerebral disturbance; whereas, in all those fevers which are attended with prostration or feebleness, the brain and nerves are generally prominently disordered throughout the whole course.

There exists no small degree of difficulty in arranging continued fevers under such heads as will exhibit a distinct and comprehensive view of all the prominent modifications or forms in which they are wont to occur. In relation to the *grade* of febrile excitement, fevers may be divided into *three* principal varieties: namely, *synocha*, *synochus*, and *typhus*.

1. *Synocha.*—This head embraces all those fevers which are conspicuously *inflammatory*, both in relation to their general and local phenomena. They are usually divided into *idiopathic* and *symptomatic;* the former, constituting what is generally termed simple *inflammatory* fever; and the latter, embracing those fevers which result from acute local inflammation. Hardness, quickness, and tension of the pulse, are essential character-

istics of *synochal* fever ; but in relation to the size and activity of the pulse, there exists great diversity in the different varieties of this grade of fever. In simple inflammatory fever the pulse is *full*, vigorous, and hard ; whilst in some of the phlegmasia, in acute gastritis, enteritis, and peritonitis, its volume is usually small, although its firmness, tension, and quickness are conspicuous, and the necessity of prompt and vigorous depletory measures extremely urgent. The blood in synocha is thicker, and contains a smaller proportion of serum than in health, and is disposed to separate speedily and very completely into its constituent parts. The crassamentum becomes dense, concave, or cupped on its superior surface, and coated with a thick layer of yellowish fibrine. The albumenoid, or coagulable portion of the serum, does not become condensed when subjected to the action of heat, alcohol, &c. but is converted into a white pap-like matter. Boiling water poured into the serum of blood taken from a patient labouring under synocha, converts it into a whey-like fluid, resembling a solution of soap in water, without any coagulated flakes.*

In synocha, the general energies of the system manifest no proneness to prostration, so long as the fever retains its *simple* character. The powers of vital resistance continue to the end, with no material impairment. When general fever of the synochal grade passes into a low or typhoid state, it is either in consequence of inordinate sanguineous depletion, or of the supervention of cerebral inflammation, or the occurrence of inflammation and gangrene in other organs.

Simple continued fever of the synochal grade, is rarely attended with conspicuous symptoms of sensorial disturbance, or cerebral irritation; nor is it common to meet with signs of gastro-intestinal irritation in cases of this kind. Fevers, however, rarely preserve the simple synochal character throughout their whole course. In most instances, local inflammation supervenes in some part or other. When the inflammation falls upon a fibrous structure, or upon one of the solid viscera, the energy of the febrile reaction will be increased, or at least sustained; but when it happens to appear in the mucous membrane of the alimentary canal, the brain generally becomes more or less oppressed, and the general powers of the system tend to a state of prostration.

The secretions in synocha are almost universally diminished in quantity. Cold or atmospheric vicissitudes, and a high degree of solar heat, are almost the only *general* causes of this grade of fever.

* Reil. über die Erkentniss, &c. der Fieber. Band. i. s. 494. See also Parmentier and Deyeux's Memoir in Reil's Archives für die Physiologe and B. 1. No. 3. s. 5.

Synochus.—This grade of fever is intermediate between the purely synochal and the typhus varieties of fever, and constitutes by far the most common modification of febrile reaction. It is the grade of fever which occurs in intermittents, remittents, bilious fever, and the common continued fevers which arise from *cold* and from gastric irritation. The pulse of synochus fever is active, more or less full, frequent, compressible, and free from unusual tension or hardness. The blood itself rarely differs perceptibly from its natural character, being devoid of the above named inflammatory characteristics. *The system is much less able to resist the influence of debilitating causes than under the preceding grade of fever.* It will bear a begree of depletion while labouring under synocha, which, in a fever of the *synochus* grade would produce the utmost degree of prostration.

Synochus is employed here as indicating merely a certain grade of febrile excitement, and not as constituting in itself a distinct form of fever. The reaction of the heart and arteries is only one of the series of morbid phenomena which constitute fever, and the same grade of vascular reaction occurs in maladies essentially distinct from each other. So far, indeed, as the mere action of the heart and arteries is concerned, fevers differ from each other only in *degree;* or, to adopt the language of Parry, in the greater or less momentum of the blood. It is in the capillary system of vessels, that the fundamental morbid condition resides, which establishes the essential difference of febrile diseases. The morbid excitement of the capillaries in a case of small-pox must be very different, one should think, from that which occurs in this system of vessels in remitting fever, and both may nevertheless be attended with the *synochus* grade of febrile reaction.

Typhous.—This grade of fever is lower than the preceding one, the vital powers being more prone to sink, and in general much less able to resist the influence of debilitating remediate measures. It is characterized by a weak, small, quick, and generally frequent pulse. In some instances, however, of a typhous state of fever, the pulse is nearly natural in frequency and fulness; but softness and feebleness are seldom absent, except in the commencement of the disease. An early disturbance of the sensorial powers, and a train of various nervous symptoms, almost universally attend fevers of the typhus kind.

There are three apparently very distinct varieties of typhous fever. One of these varieties is characterized by what may be called a highly nervous state of the system—the patient manifesting along with a weak condition of the vital powers, a peculiar degree of nervous excitability and excitation, and an active state of the sensorial functions. This constitutes what was formerly usually described under the name of nervous fever, the

typhus nervosus, pyrexia nervosa, neuropyra, typhus cum erethismo, and the *febris nervosa simplex* of authors.

Another variety of *typhous* fever in connexion with the deficient or sinking energies of the system, is characterized in its progress by phenomena which have been generally regarded as indicative of a tendency to putridity; the pulse, at first moderately full and active, soon becomes soft, feeble, sometimes *frequent,* and at others slower than natural, the skin is pale-dingy, or sallow, its heat elevated, and of the kind called *calor mordax,* or in some instances nearly natural, and sometimes even below the natural standard. The breath, secretions, and exhalations, are offensive to the smell, petechiæ, extravasations, colliquative hæmorrhages from the gums, the fauces, the eyes, the bowels, &c. ensue towards the conclusion of fatal cases. This variety of *typhus* fever has been described under various denominations; such as *f. colliquativa, f. putrida sanguinea, f. putrida simplex, f. sepedogenetica, f. adynamica, typhus putridus, synochus putridus, pyrexia myoica, pyrexia denophlebica, f. hæmatoseptica, septopyra, putrid fever, putrid nervous fever, typhus gravior,* &c.

There is a *third* variety of low fever, which, along with its radical tendency to prostration, is strongly characterized by a very *conspicuous torpor of the sensorial, intellectual, and general nervous functions.* Its first stage is often attended by the *synochus* grade of vascular reaction, whilst the second stage is marked by torpor, great prostration, and feeble arterial action. Its different stages are more definite in their duration, and its essential phenomena succeed each other in a more regular order than those of other continued fevers. This constitutes the genuine *typhus*—the *typhus contagiosus* of authors—a form of fever which by many is believed, and I think with correctness, to be radically diverse from every other form and variety of febrile disease.

Having made these general remarks on the principal grades and modifications of continued fevers, I pass on to the consideration of particular forms of fever.

Sect. I.—*The Synochal grade of Idiopathic Fever, or Simple Inflammatory Fever; Febris Irritativa; Pyrexia Sthenica; Febris Vasorum; Inflammatoria; Enechia Cauma.*

This variety of continued fever is attended with the highest grade of febrile excitement, associated with increased *irritability,* as well as *increased power of action* in the heart and arteries. The premonitory stage is always short, the fever coming on suddenly with distinct chills or rigors, the febrile reaction is

rapidly developed, the whole surface becoming speedily intensely hot,* the pulse full and vigorous, and rarely above one hundred and twelve in a minute, the face flushed and turgid, the eyes suffused, sparkling, and unusually sensible to the light, the temples and carotids throbbing, the head painful, the mouth and throat very dry, the breathing oppressed and hurried, the thirst for cold water very urgent, the tongue covered with a white fur, the bowels torpid, the urine very high-coloured, and small in quantity, the skin dry, harsh, and suffused with a slight blush, and the ears morbidly sensible to sounds. Delirium is not a usual occurrence in this variety of fever; but when it does supervene it generally becomes extremely violent, and greatly increases the unfavourableness of the case from its dependence, generally, on cerebral inflammation. The blood, when drawn, exhibits the inflammatory character already mentioned, i. e. the buffy coat,† cupped crassamentum, and paucity of serum, &c.

These symptoms usually suffer regular remissions and exacerbations; the former occurring in the morning, and the latter in the evening, until they finally terminate entirely under some critical evacuation. Simple synocha, or inflammatory fever, very rarely continues beyond the ninth day, and still more rarely beyond the fourteenth, and not unfrequently terminates its course as early as the fifth or seventh day. When the termination occurs about the seventh day, the symptoms usually go on increasing in violence to the fourth or fifth day; and when the disease is prolonged to the fourteenth day, the increase generally continues to the ninth, or perhaps the eleventh day.

The resolution of inflammatory fever is almost invariably accompanied by general and free perspiration, together with its never-failing concomitant, a reddish or pale sediment in the urine. In some instances, a slight hæmorrhage, particularly from the nose, accompanies the crisis. In general, these critical discharges take place a few hours after an evening exacerbation, and this exacerbation is often ushered in by a slight chill.

* The heat of the skin is of the kind usually called *burning*, in contradistinction to that peculiar biting or acrid heat which occurs in typhus fevers, termed *calor mordax*. By laying the hand on the skin of a patient labouring under inflammatory fever, the sensation of heat communicated is at first very considerable, but on suffering the hand to remain for a short time, the sensation of heat gradually diminishes, until it seems to the touch but little above the natural temperature of the body. In typhus, on the contrary, the longer the hand is suffered to be in contact with the patient's body, the more pungent and perceptible does the heat (calor mordax) become, and the biting or acrid sensation of heat remains in the hand even after it is removed from the patient.

† The buffy coat, which occurs in inflammatory fevers, differs from a somewhat similar appearance observed sometimes on the blood of typhus patients. The former is of a uniform yellowish colour, and very tenacious, whereas the latter is brittle, of a paler yellow, and presents an iridescent appearance, reflecting some of the colours of the rainbow when held in certain positions to the light.

Inflammatory fever does not, however, often continue its course throughout in the regular and simple form which has just been described. Topical inflammations, of more or less intensity, very seldom remain wholly absent in the progress of the disease. The human system is rarely in such a condition as that some organ or structure is not in a state of predisposition to inflammation; and there can scarcely be a circumstance better calculated to produce inflammation in a part thus predisposed, than the very greatly augmented momentum and peculiar condition of the blood, which exist in this variety of fever. When local inflammation supervenes in the course of a simple synochal fever, the general aspect and disposition of the disease will, of course, be considerably altered. Sometimes the brain and its meninges become inflamed, at an early period of the disease; but this occurrence, is much less common in the synochal, than in the synochus and typhus grades of idiopathic fever. Occasionally synochal fever, after having continued for a day or two, becomes complicated with rheumatic inflammation; and in some instances inflammation occurs in one or more of the thoracic or abdominal organs. In general the more the brain becomes affected, either by inflammation or sympathetic irritation, the more apt will the system be to sink into a state of prostration or oppression. When the febrile reaction is extremely vehement, or the system habitually delicate and feeble, simple inflammatory fever sometimes exhausts the vital energies, and passes into a low or typhoid state.

The constitutional predisposition to synochal fever would seem to consist in a vigorous condition of the vital powers, robust health, activity of the digestive and nutritive functions, and an irritable plethoric habit. Persons between the fifteenth and fortieth year of age, of a sanguineo-athletic temperament, appear to be most liable to fever of this vehement character. In early infancy, and in old age, simple inflammatory fever is not so often found to occur as during the intermediate periods of life.

Causes.—The exciting causes of inflammatory fever are very various. This grade of fever may be produced by cold, atmospheric vicissitudes, high solar heat, the intemperate use of spirituous liquors, too free an indulgence in high-seasoned and irritating articles of food, the sudden suppression of natural or habitual evacuations, excessive corporeal exertions, a draught of cold water when the body is heated by exercise, violent passion, mechanical injuries, &c.

Of all these causes of synochal fever, however, *cold* is by far the most common. It is from the extensive influence of this febrific cause that continued fevers of a synochal grade are so common in cold and variable climates, and during the cold and changeable months of spring and autumn in the temperate lati-

tudes. During the summer months we seldom meet with general fevers of a very phlogistic character; and pure synochal fevers are perhaps still less common in the intertropical climates. Prevailing north-west and north-east winds are particularly favourable to the occurrence of inflammatory fevers. So remarkably is this the case, that typhus fevers will sometimes assume, for a time, a decidedly phlogistic character, if the wind shift suddenly from a southern to a northern point. May not the *electric* changes of the atmosphere have some agency in the production of this effect? From the influence which atmospheric vicissitudes and sudden variations in the direction of prevailing winds are sometimes found to have on patients and convalescents confined in close chambers, or even in bed, this supposition does not seem to be improbable. There are, indeed, some writers who contend that a superabundance of electricity in the atmosphere constitutes the cause of epidemic inflammatory fevers. Hopf observes, that fevers of this kind are always most apt to prevail during those seasons and meteorological conditions, when the atmosphere is most charged with the electric fluid. Reil thinks that electricity often contributes considerably to the production of phlogistic fevers by increasing the general irritability of the system.*

It may be observed, however, that the grade or modification of a fever, does not depend so much on the character of the *remote or exciting cause*, as upon the peculiar condition of the *animal system* at the time the cause exerts its morbific influence. Thus, the same degree of cold may produce a low or typhoid fever in one, and a vehement inflammatory fever in another individual—a circumstance which proves unequivocally that such diversities depend mainly, and often wholly, on the peculiar predisposing condition of the body itself.

If of two individuals seized with fever from the same atmospheric vicissitude, one be especially prone to inflammation of the brain or of the mucous membrane of the alimentary canal, and the other to inflammation of the fibrous and serous structures, or be wholly free from any local predispositions of this kind, the fever will most probably early assume a low or typhoid grade of vascular reaction in the first, whilst in the latter it will be apt to retain its vigorous synochal character throughout its course.

When speaking of the general character and etiology of fever, I observed that in simple inflammatory or synochal fever, the principal febrific irritation is, probably, located in the vascular system—that is, in the internal membrane of the heart, arteries, and capillaries. In those general inflammatory fevers which

* Hopf, Dissertat. sistens rudimenta theor. de principio febres inflam. epidemica gignente. Reil. über die erkentniss und kur der Fieber. Band. i. s. 501. See also Gautier's work, entitled, Commentatio medica de irritabilitas notione, natura et morbis, p. 21.

arise from the influence of cold, at least, this is probably the case; for, in instances of this kind, besides the internal congestions and inequilibrium of excitement resulting directly from the impressions of this cause, a large proportion of the recrementitious elements of perspirable matter must remain mingled with the blood, (unless speedily removed by the vicarious action of some other emunctory,) and necessarily impart to this fluid qualities which are not natural to it. Most assuredly the retention of materials which have become useless to the system, and for whose constant elimination nature has provided so extensive a series of emunctories as the cutaneous exhalents, cannot be long tolerated by the animal economy with entire impunity. The blood is the natural stimulant of the sanguiferous vessels, and we must believe that its stimulating qualities are naturally in due and harmonious relation with the sensibility and irritability of its appropriate vessels. When, therefore, in consequence of suppressed perspiration, this fluid becomes surcharged with the elements of recrementitious perspirable matter, its natural relations with the heart, arteries, and capillaries will be destroyed, and irritation more or less intense must almost necessarily ensue. Why such a cause should produce typhoid fever in one, synochus in another, and pure synocha in a third individual, we may not be able to ascertain; but the grade of fever is, no doubt, determined by the particular condition of the system in relation to accidental or habitual debility, local disorder or predisposition, temperament, modes of living—in short, every thing which constitutes a deviation from perfect health.

That the degree in which the sensorium commune becomes implicated, has an important share in determining the grade of febrile reaction, has already been observed in several places. It would, indeed, seem very reasonable to conclude, that as the powers of the system depend mainly on the regular supply of the nervous influence, the more the brain, its fountain, becomes involved in disease, the feebler will be the powers of the vascular and muscular systems. All low or typhoid fevers, in truth, are characterized by early and conspicuous manifestations of cerebral disturbance, and the prostration, and encephalic disorder generally increase, *pari passu*. In fevers of the synochal grade, on the contrary, the brain and nerves suffer but little; and, when inflammation of the brain does supervene, the system and vascular reaction soon sink to a lower grade.

The prognosis in simple inflammatory fever is, in general, favourable. This, indeed, may be regarded as the least dangerous of all the varieties of continued fever, so long as it retains its simple form. When local inflammation supervenes, the danger will be more or less increased, according to the importance of the organ or structure in which the inflammation occurs, or

the variety and force of its sympathetic connexions, and according also to the intensity of the inflammation. When the breathing is free, and without cough or pain in the chest, and the abdomen neither tender nor tense to the touch, we may conclude that the fever is not of a dangerous character, from the almost certain absence of thoracic and abdominal inflammations. Slight delirium during the exacerbations is not to be considered as a very unfavourable symptom; when it becomes very violent, however, it betokens encephalic inflammation; and, of course, indicative of greatly increased danger. Richter says, that a very profuse discharge of limpid urine, occurring suddenly; liquid or watery discharges from the bowels; and very copious sweats without sedimentous urine and abatement of the symptoms, constitute very unfavourable signs in synochal fever.

The signs which announce a favourable change are, the occurrence of slight hæmorrhage from the nose; general perspiration, attended with pale urine, becoming turbid when cool; and diminution in the frequency, hardness, and activity of the pulse, and in the febrile temperature of the surface.

Sect. II.—*The Synochus grade of Idiopathic Fever. Common Continued Synochus Fever* (*Synochus Simplex.*)

The ordinary continued fevers, those which are most frequently encountered in practice, though phlogistic in their character, do not manifest that intense grade of inflammatory excitement and permanency of vital resistance which characterize the variety of fever described in the preceding section. In the simple continued fevers which form the subject of the present section, there exists, as in pure synocha, strong febrile reaction; but the vital powers are not sufficiently sustained to enable them to maintain this elevated and energetic grade of morbid excitement—and hence, although the fever may commence with a degree of vascular reaction and general strength differing but very little from synocha, yet, both the grade of febrile excitement and the general powers of life will soon decrease conspicuously, and verge to the low or typhoid state.

The principal sources of this modification of continued fever are, *cold* or atmospheric vicissitudes, and irritation or disorder of the alimentary canal and of the biliary organs. *Cold*, however, is decidedly the most common source of the ordinary continued fevers of the temperate and more northern latitudes. When the disease arises from this cause, it is generally more phlogistic in its early periods, than when it occurs as the consequence of gastro-intestinal disorder or other febrific circumstances. The *status gastricus* of the German pathologists, is, nevertheless, almost

invariably present in every modification of continued fever of the synochus grade. An early occurrence of nausea, vomiting, foul tongue, and disagreeable gastric sensations, are among the most frequent symptoms of common continued fevers. In this respect, common continued fever of the synochus grade, differs from synocha or pure inflammatory fever; the latter being but rarely attended by very manifest signs of gastric disturbance.

Simple continued synochus fever occurs under various modifications, many of which have been described by authors as distinct varieties of fever. The ordinary continued fevers of our cold and variable seasons, depending on the febrific influence of low temperature or sudden atmospheric vicissitudes, occur under various grades of violence from the simple febrile state called a cold, to the most aggravated fever tending rapidly to cerebral oppression and fatal collapse.

In the mildest modification, a slight and transient feeling of chilliness is succeeded by a moderate increase of heat on the surface; a white tongue; some increase in the frequency, quickness, and fulness of the pulse; corporeal and mental languor; dryness of the skin; more or less pain over the eye-brows; a red and slightly diminished urine; slowness of the bowels, and disturbed sleep. In some instances, the appetite is but little impaired, but most commonly it is suppressed. This grade of fever generally passes off in a few days, under a gentle perspiration or moderate diarrhœa.

The modification, however, which is especially designated by the name of common continued fever, is, by no means, so mild in its symptoms or so transient in its duration, and may be considered, in its more aggravated character, as one of the most formidable of general febrile maladies. This modification of the disease is generally ushered in by a distinct cold stage, characterized by great lassitude, restlessness, a feeling of tension and confusion in the brain, oppressed and anxious breathing, feebleness, and quickness of pulse, a clammy tongue, disgust for food, flatulency, and frequently nausea, retching, or vomiting. This stage, alternating towards its conclusion with flushes of heat, often continues for many hours before the stage of excitement is fully developed. The skin now becomes hot, dry, and suffused with a uniform, but slight tint of red; the pulse more frequent, full, and active; the face flushed; a dull, heavy, or throbbing pain is experienced in the head; the patient is restless, morose, or peevish, and feels unable to fix his attention, or to exert his mental faculties; his tongue is at first white, becoming dry, harsh, and dark-brown as the disease advances; the urine is generally red, sometimes pale, and wholly without sediment; the bowels are torpid, and the alvine discharges soft, and often of a clay-coloured appearance. There is, generally, from the beginning,

some degree of intolerance of light and sound, and the carotids and temporal arteries usually beat strongly. These symptoms commonly go on for five or six days without any material changes, except the slight remissions and exacerbations which occur in the morning and during the night. Slight delirium commonly occurs during the night for the first five or six days; as the disease continues, however, the symptoms of cerebral disorder become more and more conspicuous, so that, by the eighth or ninth day, it arrives at its acme, and either gradually declines under a favourable crisis, or passes, more or less rapidly, into a *typhous* condition or *collapse*, attended with almost constant delirium, partial stupor, dilated pupils, dry, foul, and dark-brown tongue, sordes about the teeth, hurried breathing, subsultus tendinum, picking at the bed clothes; the pulse becoming progressively weaker, smaller, and more frequent, and the vital energies sinking more and more until death takes place about the 15th, or perhaps the 17th day, and sometimes not until a later period.

In some instances of common continued fever, the symptoms of cerebral irritation are considerable at an early period of the disease, and the nervous or *typhous* stage supervenes rapidly and under a highly aggravated train of phenomena. With the development of the stage of excitement, which comes on slowly after a protracted and oppressive cold stage, strong manifestations of cerebral disorder ensue. The patient evinces great aversion to light and sound; he is tormented by uninterrupted watchfulness; his mind is greatly confused; delirium comes on early, and soon becomes continuous and often violent; the countenance is flushed; the carotids beat strongly; the vital and voluntary powers are oppressed; the skin is intensely hot; the whole surface of the body is frequently tender or sore to the touch, and transient darting pains are often experienced in various parts of the body. "An extreme irritability of the nervous system attends the development of the fever; the arms are tossed to and fro on the bed; the head is moved from side to side, and the position of the lower extremities frequently changed."* Flatulency and irritability of the stomach, with more or less of tenderness to pressure in the epigastrium, are rarely absent. The pulse is at first frequent and active, but seldom very firm or tense. The *typhous* state generally comes on as early as the fourth or fifth day, and in some instances much sooner. When this happens, the pulse becomes smaller and more frequent; the previous high delirium passes into a low muttering raving, and, finally, into a completely oppressed state of the sensorium, tending rapidly to a general prostration of the vital powers. The patient

* Armstrong on Typhus. American Edition, p. 236.

now lies on his back; moans, with his mouth open, and the eyes turned up under the lids. The retina seems insensible to light; one eye appears smaller than the other, from paralysis of one of the upper lids; the muscles of the face are variously agitated; the pulse becomes extremely rapid and small; and a clammy but warm sweat breaks out. The extremities finally become cold, the urine and fæces are discharged involuntarily, and life ceases either gradually or suddenly in a paroxysm of convulsions.

Dr. Armstrong very truly observes, that in this latter and aggravated modification of the disease, acute or subacute inflammation of the brain is unequivocally present "soon after the full emergement of the fever." He has not, however, paid sufficient attention to the same condition of the alimentary canal. In the early period, and even before the stage of excitement ensues, nausea, retching or vomiting, total disgust for food, and various other disagreeable sensations in the abdomen are scarcely ever absent; and in the more advanced stages, tenderness or soreness on abdominal pressure, a tympanitic state of the bowels, a foul tongue, with red edges, indicate with sufficient certainty the presence of gastro-intestinal phlogosis. In some cases, subacute inflammation is developed in the respiratory passages, and occasionally also in other parts of the body, according to the accidental local predispositions which may exist.

There are some other modifications of continued fever of the synochus grade, which it will be proper to notice in this place. When cold acts on a system which has been previously much under the influence of *koino-miasmata*, it will sometimes give rise to continued fevers of a manifestly bilious, or what has been called gastric character. Lassitude, a feeling of weight, tension, and dull pain in the head, depraved or obliterated appetite, acid, or bitter eructations, a sense of fulness and weight in the stomach and right hypochondrium, a sallow or icterode countenance, a gloomy taciturn disposition of the mind, transient pains in the abdomen, constipation, or bilious diarrhœa, with occasional slight creeping chills, are the phenomena which usually usher in the febrile attack. The heat of the skin rarely becomes very intense; the pulse is full, wavering, active, but very compressible, and seldom above 112 during the first few days of the fever; the tunica albuginia is tinged with bile, and in the progress of the disease a more or less icterode hue extends over the whole surface of the body. The skin is frequently moist about the heart and breast, but general or uniform perspiration hardly ever occurs before the resolution of the fever. The tongue is bitter, and covered with a thick yellowish slime, generally moist at first, but dry, rough, and dark-brown in the latter stage of the malady. The urine is highly charged with bile and small in quantity. Nausea, retching, and vomiting, always occur, and the patient

loathes all kinds of food; the desire for cool and acidulated drinks is generally urgent. The breathing is oppressed, and a short humid cough usually attends; its course is seldom very protracted, but its tendency to the *typhous* state is almost always exhibited at an early period, and unless the disease be mild, or speedily subdued, delirium, with the whole train of nervous symptoms mentioned above, and great prostration supervene by the 5th, 7th, or, at furthest, the 9th day. The remissions and exacerbations are always very conspicuous.

There is still another modification of continued fever of the synochus grade, which arises from the united influence of a damp and cold air; deficient, innutritious, depraved, and aqueous diet, mental depression, &c. The premonitory stage is long, but the fever itself varies in duration from five or six days to so many weeks. The pulse is often nearly natural in point of fulness and activity, but generally somewhat accelerated; the thirst is moderate; the appetite weak or entirely lost; the patient is torpid and drowsy; and the eyes are dull and watery; nausea frequently occurs, particularly in the morning; the heat of the surface is considerable; the tongue is white, slimy, and the taste is flat; the urine is pale, crude, and moderate in quantity, and generally surcharged with mucus. As the disease advances the pulse becomes weaker, smaller, and more frequent; delirium of a low muttering kind ensues, with hiccough, subsultus tendinum, and at last coma. The fever does not, however, always run into the nervous state. In some instances a general diaphoresis, and a mucous deposit in the urine occurs about the seventh or ninth day, and leads to a slow convalescence. There is generally more or less tenderness in the abdomen.

All the foregoing modifications of continued fevers, but more especially the second, have been confounded with genuine typhus. Dr. Armstrong has pointed out the distinctive characteristics of these maladies, and although he has since changed his sentiments with regard to the etiology and essential nature of typhus, the diagnosis which he has given between these two diseases, is nevertheless founded, I think, on sound positions.

In typhus the sensorial functions are earlier and more invariably disturbed, and the muscular prostration is greater than in the most common forms of continued fever. Mental depression or despondency, a sullen gloom of the countenance, and an almost insurmountable apathy and disinclination to mental and corporeal exertion, are remarkably characteristic of typhus, and never very conspicuously present in simple continued fever of the synochus grade. "In common continued fever the patient generally has not much inaptitude of mind, often answers questions readily, and in a pretty firm voice, without much increased agitation of the breathing; whereas in typhus, the answers

are mostly given with languid slowness and reluctance, and much speaking obviously disturbs respiration. In common continued fever the skin is usually of a brighter red than natural; whilst in genuine typhus it is always more or less of a *dusky, dingy* colour. In typhus it has an early tendency to become brown and dry; in the common continued fever it is always white, and often somewhat moist for the first week."* To these may be added the slight exanthematous efflorescence about the fourth day of the stage of excitement in typhus,† which is never seen in common continued synochus; and the very peculiar smell ‡ which exhales from the bodies of typhus patients, and which occurs in no other malady.

When common continued fever of the synochus grade remains simple or uncomplicated with manifest local inflammation, it rarely assumes a low or a very dangerous character. Instances, however, do sometimes occur, which *apparently*, without any local inflammation, continue under no very violent train of symptoms until the vital powers gradually yield, and the system sinks into a state of great debility and nervous mobility. These cases are generally prolonged to the fifth, sixth, and even eighth week. The tendency of all febrile diseases, however, is to produce inflammation in some part or other of the system; and in few diseases, perhaps, is this tendency more strongly expressed than in the more violent cases of the present form of fever. Although it cannot be maintained that local inflammation invariably pre-exists as the only immediate cause of that group of phenomena we term *fever*, it must nevertheless be admitted, that, as an *effect*, more or less of local inflammation is much more commonly present in febrile diseases than was formerly, and by many is still supposed. In common continued fever from cold, encephalic inflammation is by no means a rare occurrence. In the more violent and rapid instances of the disease, where continued delirium, at first furious and then low and muttering occurs, cerebral inflammation is, no doubt, always present. In nearly all those who die of this form of fever, the brain and its meninges exhibit marks of previous inflammation, such as effusion of serum into the ventricles and on the surface of the brain, great vascularity of its membranes, redness, vascular turgescence, flakes of effused lymph, &c.

Gastro-enteric inflammation, also, is a common occurrence in the severer instances of this variety of fever. Tenderness of the abdomen to pressure—a constant disposition to lie on the back with the knees drawn up—a red and raw aspect of the edges and tip of the tongue; intestinal tympanitis, accompanied with low

* Armstrong on Typhus, p. 261, first American Edition.
† Hildebrand on Contagious Typhus.
‡ An Essay on Typhus Fever, by Nathan Smith, M. D. p. 26.

muttering delirium, are phenomena very frequently met with in the advanced stage of synochus fever,—phenomena, which give unequivocal evidence of the presence of inflammation in the alimentary canal. In many cases, both the brain and mucous membrane of the intestinal tube are inflamed; and this concomitance of cerebral and intestinal inflammation renders the disease in the highest degree unmanageable and dangerous. Not unfrequently, however, the brain is the only organ which suffers inflammation. When the cerebral affection is unaccompanied by gastro-intestinal inflammation, the patient seldom sinks so rapidly into the typhoid state, as when the fever is attended by both these local affections. Great prostration and conspicuous typhous symptoms, in common continued fever, are almost always associated with the above named signs of gastro-enteric inflammation.

The mucous membrane of the respiratory organs too, generally suffers irritation or some degree of inflammation. More or less cough occurs in the majority of cases; and in some instances the pectoral oppression and difficulty of respiration from this cause, becomes a prominent and serious affection.

Prognosis.—When symptoms of local inflammation do not supervene, the disease generally yields to a moderately antiphlogistic treatment, and terminates favourably under a critical diaphoresis within the first two weeks. Early and violent symptoms of cerebral disorder are indicative of much danger. Continued, low muttering delirium, picking at the bed-clothes, paralysis of one or both of the upper eye-lids, continued agitation and distortion of the muscles of the face, eyes turned up under the lids, &c. betoken cerebral inflammation, and the utmost degree of danger.

Great muscular prostration—constant position on the back—a small, extremely frequent and weak pulse, denote a state of collapse, from which recovery is exceedingly rare, especially when connected, as it almost invariably is, with manifestations of local inflammation. Tenderness in the abdomen—a gurgling noise when fluids are swallowed—tympanitis, liquid and unnatural alvine discharges in the early periods of the disease, are always indicative of great danger.

Treatment.—In the treatment of simple continued fever, whether of the synocha or synochus grade of febrile excitement, we have the following general *indications* to direct us in our remediate efforts. 1. To diminish the general momentum of the circulation. 2. To restore the natural actions of the various excretory organs—above all, those of the skin, liver, and kidneys. 3. To equalize the circulation and obviate local determinations. 4. To remove from and out of the system, as far as

may be practicable, every thing which has a tendency to irritate or unduly to excite the system.

Of these general indications, the *first* is, undoubtedly, of paramount importance, and should, therefore, always receive the earliest attention in fevers of high vascular excitement. This is, more especially, requisite in pure inflammatory or synochal fever; for here almost every thing depends on the speedy reduction of the excessive arterial reaction. *Blood-letting* stands at the head of our means for reducing vascular action, or inordinate momentum of the circulation. Whatever may be the immediate cause of the increased action of the heart and arteries, there can be no safe measure which will so speedily and effectually diminish its violence, as the abstraction of a portion of the circulating fluid. In order to obtain the full advantages which blood-letting is capable of affording in febrile diseases, it ought to be employed to the extent of producing a decisive impression on the system in the *early* period of the malady. Blood may, indeed, be drawn with benefit at any period of the disease, provided the pulse be active, quick, tense, or hard; but one decisive bleeding soon after the febrile excitement is developed, will generally do more towards subduing the violence, or shortening the duration of the malady, than a much greater quantity of blood taken away at four or five less efficient bleedings practised at intervals throughout its course. In truth, the benefit derived from blood-letting does not depend so much on the *quantity* of blood abstracted, as upon the degree of impression made on the system by the evacuation; and hence, 20 ounces taken at once will often do more good than double this quantity taken in small but repeated bleedings. "In venesection for the relief of an inflammatory affection, our object is not simply to diminish the quantity of the blood, but also to diminish the action of the heart and arteries; and it may be affirmed that 12 ounces of blood drawn from a large orifice so rapidly as to produce an immediate and decided effect on the pulse, will prove much more useful than a considerably larger quantity taken so slowly that the heart has time to accommodate itself to the loss," and thus to resist the subduing influence of this measure.*

It is certainly a good rule in practice to accomplish our intentions with as little expenditure of the resources of the system as possible. In all inflammatory affections, therefore, the blood ought to be drawn in a full stream and from a large orifice, and suffered to flow until its influence on the system is unequivocally manifested in the subdued action of the heart and arteries and the feelings of approaching syncope. This rule is particularly important in the acute phlegmasial affections. By taking away

* Scudamore on the Blood.

blood in this manner, we obtain a more decisive and permanent reduction of the phlogistic excitement, and with a *smaller expenditure of the blood* than when the evacuation is less rapidly and efficiently made; since in this latter case, it must generally be frequently repeated before the desired reduction of the vascular reaction is effected. There is another circumstance which renders very efficient blood-letting in the onset of febrile diseases, preferable to less decisive but repeated abstractions of blood. However much the system may be subdued by a copious bleeding in the commencement of a fever, the vital energies soon rally sufficiently to prevent dangerous prostration from this measure; but when the blood, though not copiously at a time, is *frequently* drawn, it happens, sometimes, that at last the system is suddenly prostrated into a state of collapse, out of which the most potent stimulants will hardly suffice to raise the patient. I remember, with pain, the unfortunate lot of an amiable and intelligent friend. He was a man of a healthy constitution, and fond of indulging in the pleasures of the table. He was seized with simple synochal fever from cold. His physician bled moderately; the fever went on unchecked; he bled again and again daily; after the seventh bleeding there was still too much quickness and tension in the pulse; the lancet was inserted the *eighth* time, and the patient almost immediately sunk into a state of collapse. Stimulants, both external and internal, the most diffusive and potent, were now diligently applied, but all in vain; he lived but a few hours longer.

In fevers of the *synochal* or highly phlogistic grade, almost every thing depends on the speedy reduction of the excessive vascular excitement. Prompt and decisive blood-letting is indispensable in fevers of this kind. In the ordinary continued fevers of a less vigorous character, or the *synochus* grade where local inflammation has not already supervened, it is not often necessary to draw much blood. One or two bleedings, to the extent of making an evident impression on the system, will generally moderate the arterial action sufficiently; and in the milder instances of the disease, blood-letting may sometimes be wholly dispensed with. As the principal danger, however, in fevers of this kind, depends on the supervention of local inflammation, and as this is by no means an uncommon occurrence, even in fevers which at first appear to be mild, it is always best to moderate the general momentum of the circulation at once, by an adequate bleeding in the commencement, in order to lessen, as much as may be in our power, the liability to visceral inflammation. In the treatment of every form of fever, the prevention, or the speedy removal of local inflammation, constitutes a chief object of remediate attention; and there is no general remedy

which answers this object more directly, than the judicious employment of the lancet.

In the employment of blood-letting the pulse must be our principal guide. The quantity and frequency of the bleedings must be regulated chiefly by the state of the pulse, and particularly by the effects produced on it by the evacuation. There are, however, various other circumstances, which it is of much importance to bring into view, in the judicious management of this remedy. The temperament of the patient, the age, sex, constitutional predisposition, mode of living, climate, habits, &c., all claim especial attention. A native of an intertropical country will, *cæteris paribus*, rarely bear the same extent of depletion as an inhabitant of a northern climate. Persons of a nervous or relaxed habit of body, sink much sooner from the loss of blood than the sanguineous and athletic. In very old people we must proceed with more caution in the use of the lancet than in the youthful and middle aged; nor can we in general take as much blood without detriment from the luxurious, indolent, and intemperate, as from the vigorous, active, laborious, and temperate.

The inflammatory or buffy coat of the blood may, in general, be regarded as an indication for the further employment of the lancet. It is not, however, to be implicitly relied on as a guide in this respect. In rheumatic fever for instance, the blood will often continue to exhibit the buff after bleeding has been practised to the utmost allowable extent. Nor are we to regard the disappearance of this phenomenon after several bleedings, as an objection to the further use of the lancet, if the pulse continues to indicate its propriety.

A hard, tense, or quick and corded pulse, will always justify the use of the lancet, whatever may be the general character of the disease, or at whatever period of its course it may occur. In the commencement or early period of the disease, the blood should be suffered to flow until a strong impression is made on the system; but when bleeding is practised at an advanced stage of the fever, it will, in general, be most prudent to carry it to the extent of producing only a slight effect on the pulse, as a very decided impression might readily precipitate the system into a fatal collapse, or at least dangerous prostration.

As the bowels are almost invariably more or less constipated in the varieties of fever under consideration, and liable, therefore, to irritation from this source, they ought always to be early evacuated by suitable purgatives. Without doubt, the secretions which flow into the intestinal canal, in every variety of fever, become additional sources of irritation when suffered to accumulate; and hence, simply with the view of removing these accidental supporters of febrile excitement, *purgatives* are important remedies throughout the whole course of acute diseases.

In synochal and the common continued fevers, however, purgatives are beneficial, not only by evacuating the irritating contents of the bowels, but in some degree also by their depletory and revulsive effects. The choice of the purgatives is by no means a matter of indifference in the treatment of the present variety of fevers. The saline purgatives are generally preferable, on account of the usual mildness of their operation, and their tendency to allay febrile excitement, by their general refrigerant influence, independently of their evacuant effects. The sulphates of soda and magnesia are excellent aperients in fevers of a highly phlogistic character. They may be administered with peculiar advantage, according to the following formula:

℞. Sulphat. sodæ vel magnes. ℥ii.
Tart. antimon. gr. i.
Solve in aquæ fontanæ. ℥x.
M. fl.

Of this solution a wine-glassful may be taken every hour, until purging is produced.

In the commencement of the fever, when there is reason to apprehend the early occurrence of serious cerebral affection, a mixture of jalap and cream of tartar is an excellent purgative. Twenty grains of the former, with two scruples of the latter article, may be administered for this purpose. This mixture generally causes very copious sèrous stools, and thus acts at once, as a strong revulsive upon the brain, and as an active depletory measure.

In those cases of continued fever which are attended with manifest derangement of the biliary organs, six or eight grains of *calomel* should be exhibited a few hours before the saline purgative is administered. *Cremor tartar* dissolved in tamarind water, or the Seidlitz powders, constitute very excellent laxatives in inflammatory fevers, after the bowels have been once well evacuated by a more active purge.

Useful, however, as purgatives most certainly are, in fevers of the character now under consideration, they may, nevertheless, be as readily abused in the present, as in other forms of fever. Harsh, drastic, or very frequently repeated catharsis, seldom fails to do much injury by exciting great irritation or subacute inflammation in the mucous membrane of the alimentary canal, and, perhaps, also in some degree, by disturbing the natural tendency of these fevers to terminate by a critical discharge from the cutaneous exhalents. After the first purge, which ought to be sufficiently active to evacuate the bowels well, the milder laxatives alone should be employed in such a way as to procure two or three gentle evacuations daily. These observations are made in reference to simple or general inflammatory or synochus fevers; for, in many of the most dangerous *phlegmasial* diseases, *very active* purgatives are often decidedly bene-

ficial by their revulsive effects, as well as by their tendency to moderate general febrile excitement. Thus, in arachnitis, in peritonitis, in acute ophthalmia, &c. active cathartics often contribute very materially to the reduction of the malady.

Diaphoretics are well calculated to do good in fevers of a high grade of excitement. Torpor of the cutaneous exhalents is generally the first link in the chain of morbid actions which take place in the development of these maladies, and continues often throughout the greater part of their course, unless overcome by the employment of suitable diaphoretics. In vain will we look for the subsidence of such a fever, so long as this important emunctory remains inactive. The benefits which accrue from this class of remedies are, however, by no means proportionate to the copiousness of the evacuation they produce; for in almost every variety of continued fever, much more advantage usually results from a moderate and uniformly diffused diaphoresis, than from very profuse sweating. In the early period of inflammatory fever, it is generally extremely difficult, and often impossible, to procure more than a very partial and transient diaphoresis. Nevertheless, the remedies which are commonly employed to produce diaphoresis, possess the power of moderating febrile excitement, independent, apparently, of any evacuant effect; and hence, although we may fail in procuring an adequate discharge by the skin, considerable benefit will generally arise from the early and regular employment of such medicines. *Nitre*, which is one of our most valuable *diaphoretics* in inflammatory fevers, manifests also no inconsiderable power in reducing the general phlogistic condition of the system. The same is still more conspicuously the case with *antimony*, and these two articles are accordingly almost universally employed in fevers of a phlogistic diathesis. *Nitre* and *tart. antimonii*, are usually administered in combination, in doses of from ten to fifteen grains of the former, to one-eighth or one-tenth of the latter, every two or three hours. This combination, however, sometimes acts strongly on the bowels, and gives rise to irritation, tormina, and frequent watery stools. Such effects tend greatly to increase the violence and danger of the disease, and must be speedily counteracted by mucilaginous drinks, and minute doses of calomel and ipecacuanha. Thus:

℞. Calomel gr. j.
Pulv. ipecac. gr. vii. M. Divide into eight equal parts, of which one is to be taken every half hour or hour.

This combination, when aided by mucilaginous diluents, seldom fails to subdue the gastro-intestinal irritation produced by irritating remedies or other offensive ingesta. This is a point, to which great attention should be constantly paid. The exhibition of nitre and antimony or cathartics, after the effects just men-

tioned occur, is exceedingly improper, as it must almost inevitably increase the violence and dangerousness of the malady. It should always be recollected that the chief danger in fevers of this kind, arises from the local inflammations which are so apt to occur; and our main object should be to prevent the occurrence of inflammation, or to subdue it as speedily as possible.

I have usually preferred administering the *nitre* and *tart. antimonii*, according to this formula, as being much less apt, I think, to irritate the stomach and bowels, than when given in the form of a powder.

℞ Nitrat. potassæ ʒij.
Tart. Antimonii gr. j.
P. extract. glycyrrh ʒjj.
Mucilag. g. arab. ℥ss.
Aquæ fœniculi
Aq. fontanæ āā ʒiv. M. ft. Dose—a table-spoonful every hour or two.

Cullen was of opinion that the antiphlogistic effect of tart. antimonii depends on the *nausea*, and consequent relaxation which it produces when taken in full doses; but this opinion has not been confirmed by experience; it being now very generally admitted, that it possesses a sedative or contra-stimulant power, wholly independent either of an evacuant or nauseating effect. Of late this article has been much employed by Rasori and his followers as a contra-stimulant, in what may well be called enormous doses. It is asserted that when given in large and *frequent* doses, to the extent of from twenty to thirty grains daily, it rarely produces emesis, and often not even nausea, but greatly diminishes the action of the heart and arteries, and general as well as local inflammatory action. In Italy the most violent inflammatory fevers are treated, and according to the published reports with success, by large and frequently repeated doses of this article, without any direct depletion whatever. Of this practice I can say nothing from my own experience. That it may be adequate to subdue inflammatory excitement can scarcely be doubted, but neither its safety nor its successfulness appears to me such, as to warrant the relinquishment of *depletion*, with the usual antiphlogistic auxiliaries in favour of its exclusive employment. In small doses antimony is a safe and an important medicine in the treatment of inflammatory fevers. From one-eighth to one-tenth of a grain given every hour or two, will generally contribute materially to the reduction of febrile reaction, and rarely fail ultimately to excite the cutaneous emunctories. I have been led to believe that the diaphoretic and antiphlogistic effects of this antimonial are more certainly and conspicuously displayed when administered in a considerable portion of some bland nutritive or mucilaginous fluid, than when given in the form of powder, or an ordinary aqueous solution. One grain of tart.

antimonii, may be dissolved in a pint of barley water, and drank in the course of four or five hours. Antimony must be used very cautiously, however, in cases attended with symptoms of gastric irritability or irritation. Its salutary powers are most conspicuously displayed in the pure synochal fevers, although more or less benefit may be derived from its judicious employment in every modification of fever attended with an increased momentum of the circulation, and a dry and preternaturally warm skin.

James' powder, in small and repeated doses, is also an excellent antiphlogistic diaphoretic, in fevers of this kind. It may be given by itself, or in union with nitre, in doses of half a grain of the former with twelve grains of the latter, every two hours. Of all the sedative diaphoretic remedies I have yet employed, the most powerful is a liquid antimonial preparation, somewhat similar to the old diaphoretic antimony in its composition, prepared by Mr. Edward Evans, an apothecary of this city. This preparation is but little known, although, from what I frequently witnessed of its effects, I am fully satisfied that it is a peculiarly valuable remedy. Mr. Evans is the only person in this country who prepares this antimonial remedy, and no measures whatever have been taken by him, or by any one else, to bring it into notice.

Digitalis in small and frequent doses, either alone or in combination with nitre, will sometimes aid considerably in reducing excessive vascular action. From a quarter, to a half a grain, administered every two hours, rarely fails to make some impression on the pulse, in the course of 48 hours. It is particularly appropriate in those instances where, after due depletion and catharsis, the pulse remains quick, somewhat active and frequent, and where it may be doubted whether more blood may yet be prudently abstracted.

Mercury is not applicable to the treatment of simple *inflammatory* fever. In common continued fevers of a less violent grade, especially in instances attended with biliary disorder, and in cases which become complicated in their course with subacute visceral inflammation, the mercurial influence will frequently afford important advantages. In no case, however, ought mercury to be administered with a view to its constitutional influence, before the general momentum of the circulation has been considerably diminished by bleeding and purging. Where opportune and moderate evacuations, together with blisters, fail to arrest cases of common continued fever, attended with *subacute* inflammation, "calomel," says Dr. Armstrong, "should be given as a salivant. On numerous occasions," he affirms, "I have seen an evident improvement in visceral inflammations from the time that ptyalism took place." I must again observe,

however, that mercury is salutary only in those modifications of continued fever, where the general powers of the system and the action of the heart and arteries evince a tendency to a moderate grade of febrile excitement. Where the vital resistance and actions are vigorous, or where very acute and rapid visceral inflammation is present, nothing but the most prompt and efficient employment of the lancet can afford any reasonable hopes of success. In most instances of common continued fevers, however, there exists a radical tendency to a typhoid state, and the inflammations which arise are usually of a slow or subacute character. In such cases mercury may be accounted as among our most useful remedies, when preceded by proper depletory measures. It must also be observed, that mercury can be usefully employed only in the early periods of the disease, anterior to the approach of collapse or cerebral oppression. I have generally preferred giving the calomel in two grain doses, with a few grains of ipecacuanha, every four or five hours, until the gums became slightly affected. I have often found the skin to become moist, the pulse softer and less active, and the symptoms generally to abate, as soon as the mercurial influence became perceptible in the gums.

There are various other general antiphlogistic remedies of minor importance, which may be occasionally resorted to with advantage in the fevers under consideration. When the disease is in a great measure subdued, and the pulse continues to be somewhat quick, sharp, and irritated, and the skin rather dry and hot, the following mixture will generally act very beneficially:

℞. Spirit. mindereri, ℥vi.
Spirit. nit. dulc. ℥iiss.
Vin. antimonii, ℥iss.
Syrup limonis, ℥ii. M.
S. Dose, a table-spoonful every two or three hours.

In the early period of *simple* continued fever, when the skin is very hot and dry, considerable relief may be obtained from sponging the body with cool water. In fevers of a very high grade of excitement, a draught of cold water is not only always very grateful to the patient, but tends, moreover, to reduce, for a time, the excessive febrile heat, and to dispose to diaphoresis. In cases complicated with local inflammation, however, cold ablutions will rarely do good, and sometimes manifest harm. Cool acidulated drinks, ought indeed to be freely allowed in synochal fever, so long as the skin remains dry. Lemonade, solutions of tamarinds, currant, blackberry, or strawberry syrups, form very pleasant and useful beverages in febrile affections. When the surface is moist with perspiration, the drinks should be tepid. The mild diaphoretic infusions, such as elder-blossom tea, infusions of eupatorium perfoliatum, balm, marjorum, &c.

together with spiritus mindereri, or spirit. nit. dulc. minute portions of tart. antim. or the saline effervescing draught, are appropriate and useful remedies in the latter periods of the disease, when the febrile irritation is about declining under a gentle diaphoresis.

Although topical remedies are not particularly indicated in the treatment of *simple* or general fevers, yet as synochal and common continued fevers are apt to become complicated, during their progress, with visceral inflammation, local remedies often become indispensable to the safety of the patient. The brain and mucous membrane of the alimentary canal, are most frequently the seats of these secondary inflammations. In some instances, perhaps in the majority, both these structures become inflamed at once ; in others, one of them alone suffers inflammation. The occurrence of cerebral inflammation in common continued fever is always an accident of the most alarming and dangerous character, and ought to be promptly and vigorously counteracted by every efficient means in our power. In the more violent cases of the disease, symptoms of approaching cerebral inflammation sometimes manifest themselves soon after the full development of the fever, but in most instances, the inflammation does not show itself until about the fifth or sixth day of the disease. Where there is reason to apprehend the occurrence of cerebral inflammation, or where it has actually commenced, blood should be at once drawn until syncope approaches, and one or two brisk cathartics administered. Topical bleeding by leeching, is generally especially recommended in such cases; but my own experience leads me to place much more reliance on cold applications to the bare scalp, with blisters on the back of the neck, and a few cups to the temples. As leeching, however, does not take up a great deal of time, nor prevent the use of these latter applications, it should undoubtedly be employed if leeches can be had. Whilst these applications are being made to the head, warm fomentations should be applied to the feet and legs, in order to cause as much revulsion from the brain as possible. It ought to be particularly kept in mind, that little or no benefit will be derived from any of these applications so long as the momentum of the general circulation remains preternaturally augmented. General blood-letting, to the extent of producing a very decided impression on the circulation, should always precede the employment of leeching, cupping, or blisters, in fevers of high vascular excitement. From this precept, however, we must except the application of *cold*, which, in cerebral inflammation especially, may be employed with great benefit, however vigorous the febrile action may be. The application of *ice*, or *iced water*, to the head, is, indeed, a very valuable remedy in fevers attended with cerebral inflammation. The hair should be cut off

close to the scalp, and cold applications almost continually made to the head, at the same time that the circulation is solicited to the inferior extremities by warm or irritating applications to the feet.

The common practice in this country, of applying blisters to the scalp, is of very doubtful efficacy. From much attention to this subject, I am satisfied that little or no benefit can be derived from the application of blisters to the top of the head in cases of cerebral inflammation. Applied to the back of the neck, or between the shoulders, however, they will often assist materially in reducing encephalic inflammation, and should certainly never be neglected in such cases.

When the inflammation is seated in the alimentary canal, leeches succeeded by a large blister should be applied to the abdomen; and nothing but the blandest mucilaginous drinks allowed, with occasional laxative enemata. The usefulness of cold applications is almost wholly confined to encephalic inflammation; for in *gastro-enteritis*, they are wholly useless, and calculated rather to do mischief. Instead of cold, warm fomenting applications ought to be employed in this latter inflammation.

It should be observed that the mucous membrane of the intestines is frequently intensely inflamed, without the patient complaining of any pain in the abdomen. Ignorant practitioners, never think of inflammation unless they hear the patient complain of pain. I have known cases of continued synochus fever treated to within a few hours of their fatal termination, without the slightest suspicion, in the mind of the physician, of the existence of intestinal inflammation, because no pain was complained of by the patient, although the abdomen was exceedingly tender to the touch, and the tip and edges of the tongue clean and florid.

In all cases of general fever, it is of the utmost consequence to attend carefully to the state of the internal organs, more especially to that of the gastro-intestinal mucous structure. Firm pressure should from time to time be made on different parts of the abdomen. If the patient complain of much tenderness or pain when pressure is made, there will be reason to apprehend the existence of inflammation; and if in addition to this sign, the tip and edges of the tongue are red and clean, the presence of mucous inflammation of the bowels, may be deemed certain. Frequently, on examination, the abdomen is found so tender that even slight pressure gives rise to the severest suffering, although, without pressure, the patient does not complain of any pain.

In examining the abdomen, care must be taken to press successively upon every part of the abdominal parietes. In some instances we may press firmly upon several parts without giving rise to much uneasiness, until we come to the region over the inflamed portion of the bowels, where the slightest touch will

cause the patient to flinch, or cry out. Even when the patient is incapable of expressing his sensations, from being in a state of delirium or stupor, we may generally detect the presence of abdominal inflammation by watching the countenance while the pressure is made. If there is inflammation, the countenance immediately assumes the expression of pain and suffering, on compressing the abdomen. During the whole course of the present variety of fevers, the strictest attention should be paid to the removal and exclusion of every thing which is capable of irritating or unnecessarily exciting the system. In synochal or inflammatory fever, the chamber should be kept quiet, cool, and obscure; and besides the beverages already mentioned, and thin barley or toast water, no nourishment whatever should be allowed. This is a most important though very often much neglected requisite in the safe remediate management of fevers. The most judicious treatment, in other respects, is frequently rendered abortive by a want of proper dietetic regulations.

Tonics, or stimulants, are very rarely necessary during convalescence from inflammatory or common continued fever. They would indeed very generally prove prejudicial. For several days after the complete subsidence of the fever, the patient ought to refrain from solid animal food, and above all from high-seasoned articles of diet. Farinaceous liquids, and weak animal broths, taken in moderation, will in general be quite sufficient for the first four or five days of convalescence.

Sect. III.—*Typhus.*

There is, perhaps, no form of febrile disease, concerning which physicians have expressed a greater variety of conflicting opinions than typhus fever. Long an object of the deepest interest and attention, it might well be presumed that every circumstance calculated to illustrate its nature and remediate treatment, must have been abundantly noticed and accurately estimated. Whatever industry and carefulness of observation may have been bestowed on this subject, however, the result has not been very flattering, for even at this day there exists great discrepancy of opinion concerning many of the most important points of its pathology and treatment.

Without entering into a detail of the vague and arbitrary employment of the term typhus, both in the writings of the ancient and of many of the modern physicians, it will be sufficient to state, in limine, that typhus is here regarded as a *peculiar* form of fever, capable of propagating itself by contagion—commencing often like synochus, and passing into a state characterized by a

stunned or torpid condition of the sensorial powers, with great prostration of strength, and delirium.

Symptoms.—(Premonitory stage.)—A peculiar uneasy sensation in the pit of the stomach, want of appetite, slight giddiness and nausea, pale, shrunk, and dejected countenance, dull and heavy eyes, often tremor of the hands, and a general feeling of weariness, debility, and disinclination to mental and corporeal action. These premonitory symptoms usually continue from three to six days, terminating in those which mark the stage *of invasion*—viz: slight chills, alternating with flushes of heat; an entire disgust for every kind of food; tongue covered with a thin whitish fur; considerable nausea, and sometimes vomiting; a quick, small, and irregular pulse; a confused and heavy sensation in the head, and increased mental and physical depression. This stage generally occupies from six to twelve hours, and terminates in the stage of *excitement.* The febrile heat now increases considerably, the face is slightly flushed, the pulse rises in strength and fulness, the skin becomes dry, the lips parched, there is considerable thirst for cool drinks, the tongue becomes more furred and slimy, the bowels are usually torpid, the mind is more confused, the patient fretful, restless, and watchful, with an anxious expression of the countenance, the urine is small in quantity and reddish, the head feels heavy, much confused, and vertiginous; during the first two days of this stage occasional manifestations of slight delirium occur during the night. About the end of the second, or during the third day of this stage, slight catarrhal symptoms usually supervene—such as suffused and injected eyes, moderately inflamed fauces, somewhat painful deglutition, more or less oppression in the chest, attended generally with a short dry cough. There is often some tension and tenderness in the hypochondria, more especially the right one. (Hildebrand.) Pains in the back, loins, and extremities, are rarely absent in this stage, and in most cases a general soreness is experienced throughout the whole body. Towards the close of the third day of the stage of excitement, there is usually much giddiness and sensorial obtuseness present; the patient appearing even at this early period of the disease, as if under the influence of some narcotic. The cerebral functions now become more and more disturbed, hearing becomes obtuse, delirium more frequent and considerable, and the general torpor gradually increases. Hildebrand asserts that a peculiar miliary exantheme occurs on the surface about the fourth day of this stage, which he considers as essential to the perfect and regular development of the disease. The same observation is made by Hartman. One of the most striking characteristic phenomena of typhus is the almost insurmountable aversion to corporeal and intellectual exertion manifested throughout nearly the whole course of the dis-

ease. The patient moves slowly, and seemingly with great reluctance, and his answers to questions are hesitating, short, and peevish. The stage of excitement generally continues about six or seven days before it terminates in the stage of *collapse*, though this *sinking* stage sometimes supervenes at a much earlier period, and occasionally comes on a few days later. The occurrence of a collapse is manifested by the subsidence of the previous inflammatory symptoms, and the supervention of great prostration; feebleness, and greater frequency of the pulse; a dry, brown, and eventually black tongue; teeth and prolabia incrusted with black sordes; a stunned, confused, and deranged state of the sensorial functions, with more or less constant, low muttering delirium;* total apathy and indifference to surrounding objects; generally great difficulty of hearing; floccitatio, subsultus tendinum, twitching of the muscles of the face, great difficulty of protruding the tongue, constant recumbence on the back, and gradual sliding down towards the foot of the bed from deficient muscular power; a peculiar biting heat of the skin called *calor mordax*, and finally, in violent cases, dark spots or blotches on the surface, a deep guttural or sepulchral voice, hiccough, and a tympanitic state of the abdomen. Tenderness of the abdomen to pressure, is one of the most common symptoms in the latter periods of typhus. (Hildebrand, Broussais.) During the collapse, the urine is rather copious, pale, and often foams like beer when voided into a vessel; there is generally also a manifest tendency to diarrhœa in the latter periods of this stage, the discharges being watery, acrid, and highly offensive. Towards the termination of this stage, particularly when it tends to a fatal end, coma, more or less complete, is seldom absent, from which, however, the patient may usually be roused for a few moments. The period of collapse generally continues from seven to nine days, terminating either in slow convalescence or in death. The occurrence of convalescence is announced by the appearance of a gentle and uniform moisture on the skin, a reduction of the acrid heat of the surface, a moist tongue cleaning along the edges, more copious and sedimentous urine, abatement of the delirium, and short intervals of repose, and in some instances moderate diarrhœa. In some cases these phenomena of a favourable crisis do not take place until the seventeenth or even the twenty-first day, but in the majority of instances they occur about the thirteenth or fourteenth day of the disease. The progress of convalescence is generally tedious, and the debility both of body and mind, after the total subsidence of the fever, is always very considerable.

* During the low and tranquil delirium of typhus, the mind is usually occupied and tormented by some one prominent idea or object. Hildebrand compares it to the mental workings of a somnambule.

Such are the course and principal phenomena of simple typhus in its regular progress. Deviations and various irregularities do indeed frequently occur, even in the simple form of the disease, but they are seldom such as to efface the peculiar character or essential phenomena of the malady.

Typhus, however, is subject to certain prominent modifications, which, as they require corresponding changes in the mode of treatment, require particular notice. In some instances, the disease is early attended with internal visceral inflammation, a complication which adds considerably to the rapidity and danger of the malady. This modification constitutes the inflammatory typhus of Armstrong. The typhoid pneumonia, so extensively and fatally prevalent throughout this country, in the years 1811, 1812, and 1813, was of this kind.

The brain, the lungs, the mucous membrane of the alimentary canal, the liver, and the peritoneum, are the parts most apt to become inflamed in typhus; and of these parts, the brain and intestinal tube are most frequently the seat of the inflammation. Most commonly the phlegmasial symptoms do not supervene until the second or third day of the stage of excitement, though occasionally the local affection manifests itself much earlier.

When the brain is inflamed, there is generally deep and pulsating pain in the head; flushed countenance; throbbing of the carotids; redness and morbid sensibility of the eyes; irritability of temper; transient pains in the extremities; great præcordial oppression; irregular respiration; continued watchfulness; visual illusions; early and almost unintermitting delirium; a glary and blood-shot appearance of the eyes; contracted pupils; intolerance of light; gloomy and agitated countenance; continued moaning and coma. (Armstrong.)

When the lungs are inflamed, the ordinary symptoms of pneumonia are superadded to those of typhus. Pain and cramps in the inferior extremities; or, pain along the course of the spine, with irregular and difficult respiration, (unconnected with pneumonic symptoms) and a peculiar uneasy feeling in the pit of the stomach, indicates the existence of spinal inflammation. The signs of enteric inflammation are often much more obscure. Tenderness and tension of the abdomen; an anxious and disturbed countenance; a very small, quick, and frequent pulse; constant recumbence on the back; much retching or vomiting; longing for cool drink; a burning sensation in the pharynx; difficult deglutition and great prostration of strength, characterize this variety. The patient, however, seldom complains of pain in the abdomen, unless pretty firm pressure is made on its external surface, when his sufferings are generally strongly expressed both by complaints and by the expression of his countenance.

There is another modification of typhus, the *congestive*, which

is characterized by the following phenomena: a want of febrile reaction, after the stage of oppression, the system remaining in an oppressed condition, throughout the whole or the greater portion of the course of the disease. The vital powers are overwhelmed and oppressed, and the patient appears to sink, progressively, from the moment the disease commences until the vital actions cease altogether. In the more aggravated cases of this kind, there is, from the beginning, extreme lassitude and debility, attended with deep-seated pain in the head, with a feeling of weight and vertigo; the face remains pale; respiration is much oppressed and slow; the pulse is struggling, small, feeble, slow and variable; the skin relaxed, damp, and usually below the natural temperature; the countenance confused, vacant and anxious, the patient appearing as if stunned by a blow. The eyes are generally dull, watery, vacant, and often red; the bowels at first torpid; but in the advanced period of the disease often affected with watery diarrhœa. In the commencement, the tongue is pale, slimy, becoming rough and brown afterwards. Toward the close, petechia, colliquative hæmorrhages, and involuntary stools, are apt to occur. Sometimes coma is among the first symptoms, and continues to the end of the disease; and not unfrequently a complete state of insensibility and torpor, supervenes soon after the disease makes its attack. (Armstrong.)

Cause.—In relation to the cause of typhus, much difference of opinion exists among physicians. Whilst some maintain that it may be produced by any of the ordinary causes of fevers;* others believe that it is essentially a specific disease, and dependent exclusively on a peculiar virus or morbific agent. Dr. Armstrong has advanced the opinion, that typhus is often generated by the same miasm that produces remittents and intermittents; an opinion, however, which does not appear to have obtained many advocates. It is, indeed, not to be denied, that when marsh miasmata, or, perhaps, any of the usual causes of fever, act on a system which has been depressed and debilitated by the enervating influence of cold, want of nourishment, mental distress, &c. a low or *typhoid* state of fever will be developed; but the course and characteristic phenomena of such fevers, do not accord with those which mark genuine contagious typhus. If koino-miasmata (malaria) were capable of producing typhus, we should find this disease (one might reasonably expect) among the prevailing forms of fever in all miasmatic districts, which, however, is contrary to general observation. During the years 1822–23–24–25 and 26, miasmatic fevers were extremely common throughout nearly every section of this country; and yet, typhus was but very rarely observed. There are, on the other

* Good's Study of Medicine, vol. ii. Reil. Fever, Lehre. band. 2.

hand, localities where typhus has very frequently prevailed with great severity, but where intermittents and remittents are almost unknown. Dr. Smith states, that "on the Connecticut river, from Northampton in Massachusetts to its source, a distance of more than two hundred miles north and south, and on all its tributary streams on both sides, for a hundred miles in width, there has been no instance of any persons having contracted the intermitting fever, from the first settlement of the country to the present time; and yet typhus fever has prevailed more or less in every township within that tract of country." In confirmation of his opinion on this head, Dr. Armstrong affirms that remittents often assume the appearance and character of typhus; and that these two forms of fever resemble each other in many of their most striking symptoms. "Remitting fever," he observes, "is always attended with a simultaneous affection of the brain, the mucous membrane of the respiratory passages, the mucous membrane of the alimentary canal and of the liver—a combination of symptoms always present in typhus." If, however, resemblances of this kind are to be admitted as evidence of identity of cause, we might, with equal propriety, refer small-pox, catarrhal fever—nay, almost every form of disease, to one and the same cause. The characteristics of typhus do not consist in any of these circumstances. With regard to the alleged conversion of remittents into typhus, it may be observed, that the former do, indeed, in some instances, assume a low or typhoid character; but this may be predicated of nearly every other variety of febrile disease, and cannot be justly urged as an argument in favour of the common origin of the two former diseases. I have myself known ten cases of ordinary bilious remittents, brought together in an illy ventilated and narrow apartment, degenerate into low and putrid fevers of a highly fatal character. A system already suffering from a miasmatic disease, may, no doubt, be brought under the influence of those morbific effluvia (idio-miasmata,) which are generated by a number of persons crowded into narrow, close, and sordid apartments. It can scarcely be doubted, that when these two varieties of miasmata act concomitantly on the system, the product will be a form of fever neither distinctly typhus, nor yet remittent or bilious in its character.*

Whatever may be the discrepancy of opinion among physicians, in relation to the existence of a typhus contagion, all seem to be agreed upon one point:—namely, that typhus is often generated by that species of miasmata which is evolved in very crowded, confined, and filthy apartments, by the decomposition of human effluvia. The records of medicine abound in examples

* Dr. Smith on the Etiology of Epidemics, New-York, 1827.

of the production of typhus by the morbific effluvia generated in crowded and ill-ventilated ships, jails, hospitals, and the confined and sordid hovels of the poor. Although often unequivocally generated in this way, it is scarcely less certain that when once developed, typhus elaborates a peculiar virus or contagion, by which it may afterwards be communicated to those who come within the sphere of its activity. It should be observed, indeed, that there is much weighty authority extant against the existence of a typhus contagion. As positive observations cannot, however, be adequately countervailed by negative facts and speculative objections, we are constrained to give credence to the reality of such a contagion, by the vast body of direct testimony we have of the repeated propagation of this disease in a manner demonstrative of such an agency.* Wedekind states that, during the campaigns of the French against Russia, the typhus contagion which was generated in the hospitals and houses crowded with prisoners and sick, was communicated to the inhabitants along the road by which the soldiers returned; and afterwards spread gradually from the road-side to the adjacent districts, until the disease became widely prevalent. The route of the returning army from Poland through Germany could be distinctly traced by the desolating train of disease it left behind.

Somewhat analogous to the narcotic poisons, the miasm or contagion of typhus possesses a specific tendency to benumb or diminish the sensorial powers, and to depress, generally, all the vital energies. In a state of vigorous health, with the powers of vital resistance unimpaired, the deleterious operation of the typhus contagion is much retarded, and often entirely prevented. In an opposite state of the system, however, when the moral and physical energies are depressed by that combination of hardships and privations which attend succourless and hopeless poverty in times of general distress, this morbific agent seldom fails, when once engendered, to manifest its deleterious powers.

The typhus contagion, like that of small-pox, is capable of attaching itself to various substances, more especially to articles of clothing, and thus to retain its power of infecting for a long time. It is asserted, however, that *clean* articles of clothing are never rendered infectious by the deposition of this contagion; (Good)—an assertion which admits, I think, of some doubt. It is, indeed, sufficiently ascertained that filth of every kind greatly favours not only the development, but the activity and preservation of this poison; but we have no satisfactory grounds for denying that it may not attach itself to clothes not dirty, par-

* Dr. Marsh's Dublin Hospital Reports, vol. iv. In this memoir there are many cases recorded, which afford powerful evidence of the propagation of typhus by means of a contagion.

ticularly woollens, and retain its powers of infecting for a considerable period.

What length of time the typhus contagion may retain its powers of infecting when deposited in fomites, cannot, perhaps, be definitely ascertained. Hildebrand thinks it seldom retains its activity more than about three months;* but this, no doubt, depends greatly on various accidental circumstances—such as degrees of confinement, or ventilation, cleanliness, and the nature of the substance to which it becomes attached. Dr. Rush states, that he has known typhus produced by the contagion which was left in a room six months after it had been occupied by patients ill with this disease.

In a pure and free air, the typhus miasm extends but a short distance—perhaps not more than three or four feet from its source, in a sufficient degree of concentration to infect a healthy individual. It would appear that pure air is capable of dissolving or decomposing the particles of this contagion; and thus to destroy their power of infecting; or, perhaps, as some maintain, the effects of free ventilation in this respect may depend chiefly, if not wholly, on the rapid dilution of the miasm in the air, and its consequent insufficient concentration to affect the system. Be this as it may, it has been well ascertained that there is but very little danger of becoming infected in the chamber of a typhus patient, provided the air be freely admitted and cleanliness observed. In an impure and confined atmosphere, however, the miasm in question gradually diffuses itself throughout its whole extent, and retains a high degree of activity; and hence, those who visit typhus patients in narrow, dirty, and close apartments, are particularly liable to become infected.

Whatever be the virulency or activity of the typhus miasm, however, experience has ascertained that its power of affecting the human system is greatly under the control of constitutional, as well as of accidental *predisposition* to its deleterious influence. It would appear even that the condition of the organization which constitutes this predisposition is peculiar—(analogous to that which constitutes the susceptibility to small-pox or measles, &c.) and independent of the incidents of mere grade of constitutional vigour or health. It is asserted by Hildebrand, Hartman, and some other writers, that this susceptibility to typhus is greatly diminished by an attack of the disease; so that the liability to a second attack is, for a considerable time at least, much lessened, if not entirely removed. Independent of this constitutional or natural predisposition, however, there are various circumstances of an accidental character, which contribute materially to enhance the deleterious influence of this miasm.

* Ueber den Ansteckenden Typhus, p. 151.

I have already adverted to the tendency which impure air, want of wholesome nourishment, excessive muscular action, despondency, and personal filth, have in favouring the operation of the typhus contagion. It would appear, moreover, that the predisposition to infection from this cause varies with the age of the individual; for the occurrence of this disease in infancy and very advanced age, is extremely uncommon. It is remarkable, says Hildebrand, that very young children, who otherwise are so very susceptible of contagious diseases, are extremely seldom affected with typhus;* and it is almost as uncommon to meet with this disease in very aged and withered individuals. No difference, in this respect, obtains in relation to sex; but it would seem that individuals of a delicate and relaxed habit of body are more susceptible of the typhus infection than such as are robust, muscular, and well nourished.

With regard to the proximate cause of typhus, we know but little that is satisfactory. Marcus and Clutterbuck maintain that inflammation of the brain constitutes the primary and essential pathological condition of this disease. They assert that traces of cerebral inflammation are almost universally detected on post mortem inspection—an assertion which is, indeed, very often confirmed in those who die of simple or inflammatory typhus, but rarely in such as have died of the congestive form of the disease. The early, and often severe pain in the head, as well as the heaviness, confusion, and sensorial disturbance manifested in this disease, are adduced also in confirmation of this opinion. That the post mortem evidence of cerebral inflammation in typhus, is, however, far from being so general as is asserted by these writers, is manifest from the testimony of various other intelligent observers. Dr. Kirby, director of the anatomical theatre in Dublin, observes, that the *brain*, supposed by some to be the seat of inflammation in typhus, *rarely* exhibited the characters indicative of such a state. In some this organ was much *paler* than usual; in very few instances, among a great number of dissections, was there any evidence of sanguineous or serous effusion.† The same observations are made by Dr. M'Cartney, professor of anatomy; and also by Dr. O'Brien.‡

Broussais, on the contrary, regards gastro-enteritis as the proximate or primary pathological state of this malady; and he, on his part, refers with equal confidence to the appearances discovered in dissection for proof of his doctrine.

Hildebrand considers the proximate cause of the disease to consist in a condition of all the mucous membranes approaching

* Loc. cit. p. 169.

† Transact. of the Associat. of the Fellows and Licentiates of the King and Queen's College, Dublin, vol. ii.

‡ Ibid.

to inflammation, which is propagated to the sensorium commune and the nerves.

It may be observed, however, that although inflammation of the mucous membrane of the alimentary canal, is a very common affection in this malady, and in cases of a fatal tendency, perhaps very rarely absent, it is still exceedingly improbable that it constitutes the primary and essential pathological condition of the disease, and cannot, therefore, be regarded as its proximate cause. Such inflammations occur, most probably, in the course of the disease, and should be viewed as one among the ordinary morbid consequences of the fever. The importance of attending to this condition of the intestinal canal, in a practical point of view, is by no means lessened by the supposition of its being consecutive ; for, whether primary or secondary, its reduction or removal must constitute a very essential part of the remediate treatment.

Prognosis.—To the experienced physician, the general course and degree of violence of the disease, in connexion with the degree and situation of the internal local inflammation, will usually afford sufficient data for the formation of a probable prognosis. Observation, however, has made us acquainted with various particular phenomena, as being indicative, either of a favourable or fatal termination of the disease, and which it is of importance to bear in mind, in forming a prognosis.

Among the symptoms which appear to indicate a favourable tendency of the disease, are : spontaneous vomiting during the first and second days of the disease, more especially when the unpleasant cephalic sensations are thereby abated ; slight hæmorrhage from the nose, about the sixth or seventh day of the stage of excitement, is a good indication ; and moderate diarrhœa, at an earlier period, is likewise favourable. Pringle asserts, that he has often known the disease subdued by the early occurrence of gentle diarrhœa ; when the abdomen remains soft, and free from pain and tenderness to external pressure, it is a favourable sign. Moderate and quenchable thirst, during the stage of collapse, is said to be much more favourable, than when the patient expresses no desire for drink. A moist tongue during the collapse is a good sign ; and so is a moderately free and not very frequent pulse. The most certain sign, however, of a favourable termination, is derived from the state of the sensorial functions. If these are but slightly disturbed during the collapse, the issue will most probably be favourable. Most writers mention deafness as a good sign ; Hildebrand, however, has not found this observation confirmed by his experience.

The unfavourable signs are: a change in the expression of the countenance at an early period of the disease ; total want of thirst ; violent delirium during the stage of excitement ; peri-

pneumonic symptoms. But the most ill-boding of all the bad symptoms are: blindness; involuntary flow of tears; difficult deglutition; paralysis of the tongue; continued low muttering delirium; a very frequent, small, and irregular pulse; petechia; distortion of the muscles of the face; pain, or great tenderness of the abdomen; meterorism; continued motion of the hands, and picking at flocks; dysenteric stools; insensibility to active vesicatories; aphtha in the mouth; involuntary colliquative stools; colliquative hæmorrhages, &c. After all, however, patients do sometimes recover from this disease after many of the most alarming of these symptoms have made their appearance.*

Treatment.—In prescribing for typhus fever, it is of the utmost consequence to bear in mind, that its different stages are characterized by peculiar pathological conditions, each of which demands its corresponding modification of treatment. It is equally important, to attend to the general character of the disease, in reference to the three distinct varieties mentioned above —namely, the simple, the inflammatory, and the congestive. A neglect of proper attention to these circumstances, has, no doubt, contributed much to the disputes which have existed, and still exist, concerning the mode of treatment, best calculated to insure success in the management of the disease. There are physicians who, looking upon the employment of blood-letting in typhus as a practice always extremely hazardous, and very frequently ruinous, regard tonics and stimulants as the only appropriate remedies for its treatment; whilst others equally vehement in their opposition to the use of tonics and stimulants, go to the opposite extreme, and carry depletion to an extent, which cannot fail, in many instances, to cause irreparable injury. The truth is, that both stimulants and venesection are often indispensable in the treatment of this disease; and both may prove very injurious, when employed without due discrimination, at periods and under modifications of the disease, contra-indicating their use.

During the forming stage of the disease, the principal indication is to overcome the torpor of the extreme vessels of the surface, and to recall the circulation from the internal to the external parts. For this purpose, an emetic is, perhaps, the most efficient and beneficial means we possess. Vomiting excited by an emetic seldom fails to improve the condition of the skin, and to obviate the tendency to internal congestions. In many instances, indeed, the early administration of an emetic will interrupt the train of morbid actions and prevent the further development of the disease. Although especially useful in the cold stage of the disease, emetics may be used also with occasional

* Hildebrand, loc. cit.

advantage in the early period of the stage of excitement. Hildebrand, indeed, affirms that he has known decided benefit derived from the exhibition of an emetic as late as the fifth and sixth days of the stage of excitement, and the same observation is made by Pringle, Stoll, and Pichler.* Where there is much nausea, with a bitter taste, and an icterode appearance of the eyes, and the arterial reaction is not violent, some benefit no doubt may sometimes accrue from the use of a vomit. As a general rule, however, the employment of emetics in the stage of excitement, more especially where the febrile reaction is considerable, cannot be regarded either as useful or proper. When the disease is complicated with internal local inflammation, they are inadmissible. To this, however, peripneumonic inflammation forms an exception ; for in this variety of complicated typhus, an emetic, after a cautious abstraction of blood, will frequently procure much relief. Armstrong seems to prefer antimonial emetics ; but this article is apt to irritate the bowels, and to give rise to watery and exhausting alvine discharges. A large dose of ipecacuanha is not so liable to this objection, and experience would seem to show, that in other respects it is quite equal to the antimony in this disease. To assist the emetic in exciting the action of the cutaneous exhalents in the chilly stage of the disease, the free use of some mild diaphoretic infusion should be enjoined, such as teas made of the eupatorium perfoliatum, balm, elder blossom, catnep, &c.

Although *active* purging anterior to the stage of excitement can rarely be proper, from its tendency to promote the centripetal direction of excitement and the blood, yet mild laxatives ought to be among the first remediate measures. Calomel in large doses, from 10 to 15 grains, generally answers this purpose well; its usual evacuant effect being two or three copious feculent discharges, with the additional advantage of exciting the regular action of the liver.

Gentle purgations are, indeed, among our most useful remedies throughout the whole course of the disease. "The full operation of aperients in this disease," says Armstrong, "sometimes reduces the morbid heat of the skin, and the morbid force of the pulse in the stage of excitement, almost as effectually as the affusion of cold water or venesection."

In the commencement of the fever, it will, in general, be proper to exhibit an active purgative, so as to procure free evacuations. Subsequently, however, it will be sufficient to procure two or three moderate stools daily, by means of suitable laxatives or enemata. Calomel followed by a small dose of castor oil,

* Darstellungsversuch der in Mähren, 1805. Ausgebrochenen Epidemi, Bruin, 1807.

usually answers this purpose very well. Four or five grains of calomel, with a grain of ipecacuanha, may be taken late in the evening, and half an ounce of castor oil on the following morning.

Even in the stage of collapse, purgation sometimes becomes essential to the successful issue of the case. In this, as in other low forms of fever, the brain and the whole system is sometimes greatly oppressed by intestinal irritation from acrid and offensive recrementitious matters poured into the alimentary canal, and this is particularly apt to occur in the advanced periods of the disease. In such instances, the prostration is very great, the face flushed, the pulse frequent and irregular, or slow and feeble; the eyes fixed and red, with coma, delirium, or a kind of stunned torpor of the intellectual and sensorial functions. In cases of this kind, a spontaneous discharge from the bowels, of a dark, or black, and highly offensive matter, or the free operation of a purge, will frequently, almost immediately, improve the whole aspect of the disease. (Armstrong.) I have, in several instances, seen patients almost entirely insensible, and in a state of extreme prostration in the latter stage of typhus, speedily restored to consciousness, and a general improved state of feeling and strength, by the copious discharge of dark offensive matter from the bowels, in consequence of the exhibition of a purge. This oppressed state of the system from intestinal irritation, is especially apt to occur where proper laxatives have been neglected in the commencement of the disease, or where early spontaneous diarrhœa has been incautiously arrested by medicine. When purgatives are deemed proper during the collapse, they should be given in conjunction with stimulants, particularly wine, or the carbonate of ammonia, in a mucilaginous solution. From 8 to 10 grains of calomel, followed by the occasional use of a tablespoonful of senna, or of solution of Epsom salts, assisted with stimulating enemata, usually answers well in such cases. I have given castor oil with spirit of turpentine, with the happiest effect during the collapse.*

Perhaps the most important remedy in the early period of typhus, with the view of arresting its progress, or moderating its violence, is *mercury*. In the simple variety of the disease, I have known its course effectively interrupted by a gentle mercurial treatment, during the forming and early period of the stage of excitement. If the system can be brought under the mercurial influence *during this period*, it will often put a speedy stop to its progress. The plan recommended by Drs. Tully and Minor,† for the exhibition of mercurials in this disease, deserves,

* ℞. Ol. Ricini, ℥i.
Spir. terebinth. ℥ii.
M. ft.—To be taken in divided doses in the course of an hour.

† Treatise on Fever.

I think, the preference. It consists in the administration of small doses of calomel, from one to two grains every three or four hours, until slight manifestations of its specific influence occur in the mouth of the patient. If this quantity acts too powerfully on the bowels, a few grains of Dover's powder should be added, so as to restrain, but not wholly suppress its effects in this respect. Dr. Rush states, that he has known the pulse to become full, and an evident amendment to ensue on the supervention of a gentle salivation. Dr. Warren,* of Boston, also testifies to the good effects of mercury in typhus fevers. Among the German physicians, Brandis, A. G. Hecker, Sauter, and Goeden, speak with decided approbation of the employment of calomel in this disease, with a view to its constitutional operation. Hildebrand, on the contrary, declares that he has never known this remedy to do any good, but often harm.

With regard to the employment of venesection in typhus, much difference of opinion exists among physicians. In the simple form of the disease, it will seldom be necessary to employ the lancet; but in cases where the arterial reaction is strong in the onset of this stage, the cautious abstraction of blood will often be useful. Of late years the practice of bleeding, even in simple typhus, has been warmly recommended by many practitioners of enlarged experience. Dr. Mills states, that of 9195 typhus patients received into the Dublin Hospital, and who were chiefly treated by blood-letting, 740 died, making the proportion of deaths nearly 1 to 11. He further states, that out of 91 patients in St. George's Dispensary who were bled, only 1 out of 25 died; and in another place he states, that of 504 typhus patients who were bled, he lost but 1 out of 28.

Against these statements we may quote the experience of Dr. Stoker. This very respectable physician has shown from Hospital documents that the success of other practitioners who did not bleed in this disease was greater than that of Dr. Mills, they having lost but 1 out of 12; and Dr. Stoker, in private practice, lost only 1 out of 96. It must be confessed, that comparative estimates of this kind are liable to many objections. One thing, however, seems to be conclusively established by these statements—namely, that blood-letting in typhus, under judicious management, is by no means so dangerous a practice as was formerly, and indeed is yet by many supposed. As a general rule, blood-letting must be regarded as unnecessary, and often injurious in the *simple* variety of the disease; but cases, even of simple typhus, do occur, in which this evacuation may be very beneficially practised. The judicious practitioner can seldom fail to perceive when blood-letting is likely to do good. Where the

* The Mercurial Treatment of Fever.

pulse is active, quick, and strong, or full and considerably resisting, as is sometimes the case, blood ought unquestionably to be drawn. We must, nevertheless, not forget, in the use of this remedy, that typhus is a disease attended with a radical tendency to prostration; a consideration which will be a sufficient caution to the judicious practitioner to proceed with much circumspection in the use of the lancet, even in cases which most clearly indicate the propriety of the measure.

Another very important remedy in the stage of excitement of typhus is the affusion of *cold water*. When employed whilst the skin is *hot* and *dry*, and the arterial excitement considerable, cold affusions often procure great relief, and sometimes give a speedy tendency to convalescence.* A feeling of chilliness, or a temperature of the skin below the natural standard, or a moist skin, decidedly contra-indicate the use of this remedy. Under opposite circumstances, however, that is, when the skin is dry, and elevated in temperature, no remediate measure is more grateful to the feelings of the patient, or more apt to mitigate his sufferings. According to Armstrong, *cold* affusions are rarely beneficial after the fourth day of the stage of excitement; after this period, *tepid* affusions, of the temperature of about 95°, he says ought to be used. In general this may be correct, but where the surface is dry, and above the ordinary degree of heat, we may safely and beneficially use affusions at a considerably lower temperature. When the heat of the surface is unequally distributed, *partial* ablutions of the hands or feet will sometimes have a favourable effect. The existence of visceral inflammation forms an objection to the use of this remedy. After the heat of the skin has been reduced by the affusion of cold water, the patient should be dried and laid between two blankets, and warm diaphoretic ptisans administered—such as catnep, balm, or sage tea. When the brain is much affected, we should place the feet in warm water while the cold water is upon the head and over the body. (Armstrong.)

Diaphoretic remedies, such as the spiritus mindereri, the saline effervescing draught, spirit. nit. dulc. with vin. antimonii and laudanum, may be employed as auxiliaries to the more efficient means already indicated in the stage of excitement.† Active sudorifics, however, are rarely admissible. A cup of the elder blossom tea, with twenty or thirty drops of the sweet spirits of

* Medical Reports, by Dr. James Currie. Dr. N. Smith, Essay on Typhus.

† R. Spir. Mindereri. ℥vii.
Vin. Antimon. ℥iss.
Spirit. Nitr. Dulc. ℥ii.
Tinct. Opii gtt. 45.
Syrup Limonis, ℥ii.
M.—Dose, a table-spoonful every 2 hours.

nitre, may be given every two or three hours during the stage of arterial reaction. In cases attended with considerable bronchial irritation and cough, Goeden recommends the use of muriate of ammonia in solution, with a large portion of mucilage, and the extract of liquorice to disguise its disagreeable taste.*

When the stage of collapse has supervened, the plan of treatment must be exciting and roborant. In the employment of stimulants, however, much caution and circumspection must be used, lest latent inflammations be roused by over stimulation. In some instances, the tendency to visceral inflammation is kept down by the antiphlogistic measures used in the preceding stage; but no sooner are stimulants given on the occurrence of collapse, than violent delirium ensues, the eyes becoming red and filmy, the face flushed, in short, unequivocal symptoms of cerebral inflammation coming on—(Armstrong.) Should the delirium, therefore, become more violent, the skin dry and very hot, and the pulse more frequent and corded, on the exhibition of stimulants, we must either omit their further use, or employ only the milder articles of this kind. When the sensorial disturbances are moderated, or not increased, and the pulse becomes slower, and somewhat softer and fuller, and the skin less arid and hot, on the exhibition of stimulants, we may proceed with confidence in their employment. It is best always to begin with the weaker stimulants when the period for their use has arrived. Hildebrand speaks in very favourable terms of the *rad. contrayerva*, and particularly of the *angelica*. Where the collapse is not great, these and other analogous articles may often suffice, but in instances of great prostration and sinking we must resort to much more potent excitants. *Wine* is an excellent stimulant in the collapse of fevers. The white wines are the best, and of these Madeira is perhaps the preferable one. The *carbonate of ammonia* also is much employed in this country in the low states of fever. From its diaphoretic tendency, it may in general be administered much earlier on the supervention of collapse than wine, for instead of increasing the heat and dryness of the skin, an effect not unfrequently the consequence of the administration of wine, it generally causes a softness of the surface, and a freer and less irritated action of the heart and arteries. It must be given in solution, mixed with a large portion of mucilag. Thus:

* ℞. Muriat. Ammon. ʒss.
P. g. Arab. ʒii.
Extrat. Glycyrrh. ʒiii.
Spirit. Nit. Dulc. ʒiss.
Acid Scillæ, ʒiii.
M.—Dose, a table-spoonful every 2 hours.

℞. Carbonatis ammon. ʒjj.
Pulv. g. arab. ʒjjj.
Sacch. albi ℥ss.
Aq. fontanæ ℥viii.
Tinct. opii gtt. 40.
M. ft. S. A table-spoonful every hour or two.

In extreme cases, wine and the carbonate of ammonia may be given conjointly with advantage. Indeed, when we consider that ammonia has a tendency to counteract the inebriating effects of alcoholic liquors, we have reason to suppose that the union of these two articles is peculiarly appropriate as a stimulant in this disease. *Camphor* has been long celebrated as a stimulant in cases of low fever with much functional disorder of the brain. The Germans, especially, place great reliance on its use, in instances of this kind. Hildebrand asserts, that in the collapse of typhus, it is one of our most valuable remedies. Its power of moderating sensorial disturbances—particularly delirium, is often more decisively manifested in this disease, than that of any other remedy we possess. I have myself had repeated evidence of its virtues in this respect, and am inclined to think that it is not sufficiently estimated by the profession in this country. Camphor may be very conveniently given in the form of solution in sulphuric ether. Thirty or forty drops of a solution of two drachms of camphor to an ounce of ether, may be given every hour or two. Perhaps the best way, however, of administering this article, is in the form of a mixture—thus:

℞. Pulv. camphoræ ʒii.
——— G. arab. ʒiii.
Aq. fontanæ ℥viii.
Liq. anod. Hoff. ʒii.
M. ft. S. A table spoonful every two or three hours.

Musk, also, has been much praised as a stimulant in the collapse of typhus. Where symptoms of nervous excitement are conspicuous, such as subsultus tendinum, tremors, hiccough, delirium, with a copious pale urine, it will, no doubt, often do considerable good. In this country, however, we seldom get the genuine article, and as good musk is very expensive, and not upon the whole more efficient than the articles already mentioned, it is not often used by American practitioners.

Opium was formerly a good deal employed in the advanced stage of this disease. Sydenham speaks favourably of its powers, and Cullen thought it valuable for allaying the low delirium in the collapse of the disease. In that oppressed state of the system which is sometimes caused by intestinal irritation in the latter periods of typhus and typhoid diseases—and which is characterized by much jactitation, flushed face, stupor, or partial coma, with a very small fluttering pulse, I have known opium to procure great relief, especially after the operation of a purgative.

In general, however, opium is of very doubtful efficacy in this disease—more especially where there is reason to apprehend much cerebral congestion or an approach to inflammation. In all instances, however, where great prostration is attended with much general nervous irritability and sympathetic cerebral disturbance, opium is a valuable remedy; but where the sensorial and nervous energies are *torpid*, as they almost always are in genuine typhus, its effects must be, generally, mischievous. When profuse and exhausting diarrhœa occurs, or dysenteric symptoms, opium with minute portions of calomel will often do much service. In such cases, I have used small doses of Dover's powders—three grains every two hours, with decided benefit.

Phosphorus is a most potent stimulus; but its tendency to excite mucous inflammation, renders it a hazardous remedy in a disease which is so prone to gastro-enteric inflammation. It is but seldom used.

The flowers of the *arnica montana* is a favourite remedy in this disease with the German physicians. Collin, (Annus Med. Coutin.) Stoll, and Hildebrand, declare that they have used it with marked benefit in the collapse of typhus. It is said to moderate the sensorial torpor and delirium of the disease more certainly and safely than any other remedy we possess. It is given in infusion, in the proportion of one ounce to a pint of water, of which a table spoonful is exhibited every hour. Goeden asserts that the arnica has a specific tendency to act upon the brain.

Tonics do not possess much power in counteracting the prostration in the collapse of this disease. Their operation is much too slow to afford sufficient support where the vital powers are so rapidly sinking. In this observation, we ought, perhaps, to except the *sulphate of quinine;* for it can scarcely be doubted, that the liberal use of this potent tonic would frequently contribute promptly, and very efficiently, to the support of the vital energies. Given in doses of from four to six grains every hour or two, it could scarcely fail of elevating and sustaining the actions of the system, where sufficient excitability remained to the impressions of such remedies.

Blisters are very variously estimated as remediate agents in typhus. Applied about the period when the stage of collapse is approaching, that is, about the seventh or eighth day of the fever, they sometimes exert a very beneficial influence on the disease. At an earlier period they are apt to increase the general irritation of the system; and at a more advanced stage, vesication tends to increase the exhaustion, and there is much danger from gangrene of the blistered surface. When applied at the proper time, blisters will often improve the state of the skin, and tend to remove irregular determinations of the blood. Applied to the back of the neck, they generally moderate the cerebral disturb-

ance, more especially where meningeal inflammation is present. It is not necessary, nor in general proper, to suffer the vesicatory to remain on the skin until vesication is produced. When the skin is red, which will generally occur in the course of five or six hours, the plaster should be removed, and an emollient poultice applied in its stead. This will rarely fail to raise a blister in a few hours.

What has been hitherto said, applies especially to the *simple* form of the disease; and it remains for me to speak of the modifications of treatment proper, when visceral inflammation, or violent internal congestions, attend the malady.

In cases of inflammatory typhus, the antiphlogistic remedies must be promptly and efficiently urged. Blood-letting is here our main stay; but in order that it may prove beneficial, it must be employed soon after the supervention of the inflammation. "If it be delayed to the second or third day of the inflammation, it can no longer be employed without risk of irreparable injury." As a general rule, bleeding is seldom proper *after the first twenty-four hours* from the commencement of the inflammation; for the stage of collapse is apt to supervene rapidly on the occurrence of inflammation in this disease. (Armstrong.) It is always best to take away as much blood at once as will make a decided impression on the system. Dr. Armstrong advises, that the blood should be suffered to flow until an approach of syncope is induced, and to effect this with as little expenditure of the blood as possible, the patient should be supported in an erect or sitting position, while the blood is flowing. It is not necessary, generally, to take away much blood in typhus to produce an adequate effect. Unless a decisive impression be made on the system, however, little or no benefit will result from this measure. Topical bleeding by leeches or cupping, especially when the inflammation is seated in the abdomen, is also an important means for subduing the phlogistic character of the disease. Too much danger is apprehended, by many physicians, from blood-letting in inflammatory typhus. It cannot, indeed, be pretended, that the use of the lancet is without risk in an unskilful hand; but it may be confidently maintained, that in cases attended with visceral inflammation, blood may be abstracted, both by venesection and leeches, not only without mischief, but with the greatest advantage, provided it be early practised, and under the guidance of a judicious estimate of the powers of the system, and the exigencies of the case. When the inflammation is seated in the brain, much good is often to be obtained from the application of cold water or ice to the head. In instances complicated with pulmonic inflammation, calomel and opium, *after blood-letting* has been performed, is a remedy of excellent powers. A grain of each may be given every three or four

hours. In the typhus pneumonia which was so prevalent in this country in 1812, I employed this remedy in a number of cases, and frequently with marked advantage. Indeed, when we advert to the fact, that these two articles in combination, have been highly extolled by many very eminent writers,* in inflammation of the lungs, attended with a high grade of vascular action, we can scarcely doubt of their applicability in pneumonia, when connected with fever of a low grade of excitement. The pain and distress caused by the inflammation, generally soon abate considerably under the influence of this remedy; the skin often becomes moist and cooler, and the pulse more expanded, and less frequent. It must be recollected, however, that where there are symptoms indicative of cerebral inflammation, opium is wholly out of the question. It is particularly in *pneumonic* inflammation, that the combination of calomel and opium is valuable; and much benefit may also be, sometimes, obtained from it in abdominal inflammations.

In leaving this subject, it may be proper to remark, that typhus fever, whether simple or inflammatory, is always attended with a radical tendency to prostration. The pulse may at first be full and active, yet the vital powers are essentially, and *ab initio* debilitated by the influence of the remote cause of the disease. This declaration does not contradict the recommendation of antiphlogistic means in the stage of excitement. Radical debility and inflammatory action are by no means incompatible; nor need we apprehend danger from a judicious employment of antiphlogistics, where much general vascular irritation is associated with debility of the vital energies. Nevertheless, the practitioner should not forget, that whilst he is employing such measures, there is lurking at the bottom a tendency to ultimate prostration and exhaustion. With this precautionary view of the general character of the disease, he will always proceed with due care in the use of depletory measures, and keep a watchful lookout, lest the patient be incautiously precipitated into a fatal state of exhaustion.

In the *congestive* modification of typhus, Dr. Armstrong recommends blood-letting as the most efficient means for relieving the heart and internal organs from the overwhelming load of blood, and re-exciting the oppressed action of the heart and arteries.

As the internal congestions, however, appear to be the *consequence* of a previous loss of energy in the vital powers, and especially of the extreme vessels, it would seem most efficient and prudent to endeavour to remove this condition by means calculated to impart warmth and vigour to the system, and to recall

* Armstrong, Hamilton, Schmidtman.

the circulation to the extreme vessels of the surface. The means best calculated to effect these salutary changes, are stimulating frictions and warm applications to the external surface. Bottles filled with hot water, applied to different parts of the body, and frictions with tincture of capsicum, or flannels wrung out of hot brandy, are among the most effectual means for exciting the action of the extreme vessels, and deriving the circulation from the internal organs. Measures of this kind possess the peculiar advantage, in the congestive forms of fever, of exciting the energies of the system instead of diminishing its resources, at the same time that they most efficiently tend to equalize the circulation and remove the congestion. It should be recollected, that typhus is a disease of debility—that the powers of life are weakened from its commencement—and that, consequently, that mode of treatment is best which answers the purpose in view with the least expenditure of the resources of the system. Most assuredly, therefore, the removal of internal congestions by a gradual and invigorating excitement communicated to the nerves and capillaries of the surface of the body, must be much more safe than the attempt to accomplish the same purpose by abstracting blood from the patient, which, though perhaps adequate to remove the congestion, may readily convert apparent into real weakness. That the external and internal exciting measures just mentioned are, in truth, more efficient for removing the congestive states of fever than direct depletion, may be inferred from the observations of Dr. Armstrong himself. "When after bleeding," he says, "the pulse still remains oppressed, and the tide of the circulation does not return to the surface, some wine with warm water should be occasionally exhibited, and the patient speedily immersed in a bath strongly impregnated with salt, and about the temperature of 100° of Fahrenheit. On leaving the bath, the patient should be well rubbed all over with hot flannels, and then laid in an aired bed with bottles of warm water applied to his feet. This plan will often promote the flow of blood to the surface." Now, if even in the most aggravated cases of congestive fever, the internal exhibition of wine, with warm and stimulating applications to the surface, will determine the blood to the extreme vessels, and remove the oppressive internal congestion, we may conclude *à fortiori*, that in the milder instances of the congestive state, this exciting plan of treatment will be still more apt to recall the blood to the surface and equalize the circulation.

In addition to the above means for overcoming oppression from internal congestions, blisters, large doses of calomel, and purgatives, are important remedies. The bowels should be freely evacuated as soon as the reaction of the heart and arteries is in some degree re-established. Calomel in large doses appears

to be peculiarly adapted to cases of this kind. From ten to twenty grains must be given every three or four hours until the bowels are moved, and its operation promoted by stimulating enemata. Dr. Armstrong observes, that "the power of equalizing the circulation is nowhere more conspicuously displayed than in diseases of a congestive character. Before the exhibition of it the skin will be warm and shrunk, the pulse feeble and oppressed, and the whole system apparently relaxed; but no sooner is the mouth made sore by its specific influence, than the skin becomes warm, reddish, and distended with the invigorated circulation, while the pulse is full, soft, and strong, and the general energy in a great measure restored." My own experience accords fully with these observations. At the same time that calomel is given with the twofold object of procuring its purgative and constitutional influence, active rubifacients or sinapisms may be advantageously applied to the epigastrium. (Armstrong.) The congestive form of typhus often terminates fatally in a few days, and is always rapid in its course. Our remedies must, therefore, be promptly and diligently applied in cases of this kind. After the reaction has been established, the same general plan of treatment applicable to simple typhus must be pursued.

With regard to the dietetic management of this disease, it is scarcely necessary to state that the simplest kinds of liquid nourishment are alone admissible. Of these, however, the patient may be allowed as much as he can be induced to take, more especially during the sinking stage of the complaint. By keeping the stomach and bowels moderately distended with bland liquids, considerable support is given to the sinking powers of the system, and good, moreover, probably arises from it by its tendency to allay intestinal irritation, and affording the absorbents a supply of mild and invigorating fluid for the support of the system. Dr. Stoker states, that in the late epidemic typhus of Ireland, many of the patients who were brought into the Dublin Hospital, began to recover almost immediately on being allowed the free enjoyment of mild nutritious fluids. Dr. Samuel Calhoun, of this city, adopted a similar plan of treatment in the Pennsylvania Hospital, some years ago, and the result was entirely favourable.*

During convalescence, tonics in moderate doses, such as the infusions of cinchona, serpentaria, camomile, slightly acidulated with sulphuric or nitric acid, may in general be employed with advantage. The diet during this period should be mild, digestible, and nourishing, and particular care must be taken not to oppress the stomach, by taking more food at a time, than can be easily digested. Weak wine and water may be taken occasionally.

* See his essay on this subject, in the fourth volume of the Medical Recorder.

II.—GENERAL IRRITATIVE DISEASES OF THE BLOOD-VESSELS, CONNECTED WITH, OR DEPENDENT ON, LOCAL INFLAMMATION.

CHAPTER VIII.

OF INFLAMMATION IN GENERAL.

Preliminary to considering the general affections which properly belong to this head, it will be necessary to treat of the phenomena, nature, and progress of *inflammation*. The scope of this work does not admit of a full discussion of this interesting subject, but it is believed that the following summary will be found to embrace all that is really important or well established in relation to this form of vascular disease.

Although *inflammation* is characterized by *pain*, *increased heat*, *redness*, and *swelling*, yet none of these phenomena are to be regarded as strictly essential to its existence. Each of these phenomena too, is greatly diversified in its character, according to the nature of the structure in which the inflammation is located. Thus *pain*, though generally present, is not always so, and it would seem that the looser the structure, the less violent in general will be the sensation of pain. Inflammation of the lungs, of the mucous membrane of the stomach and bowels, of the brain,* and of the pericardium, has been found from the commencement, to its termination in death, entirely unattended with pain. Even the character of the pain is modified by the nature of the inflamed structure. In the mucous membranes it is burning or stinging; in the pleura it is lancinating and generally extremely acute; in the ligaments, or fibrous structures, it is dull, aching, and gnawing; and in the nerves rapid, darting, and excruciatingly severe. But although the pain may sometimes be very trifling, or even absent in inflammation, a feeling of soreness or aggravation on pressure always occurs. In this, inflammatory pain differs essentially from the pain which attends spasm.

The violence of the sympathetic febrile reaction is in general proportionate to the intensity of the pain experienced in an inflamed part. Thus, in acute bronchitis, or peripneumonia notha, there is neither very severe pain nor very vigorous reaction of the heart and arteries; whereas, in inflammation of the pleura, both the pain and the febrile reaction are almost always extremely great.

* Med. Chir. Rev. Jan. 1827, p. 234.

Increased heat is another general phenomenon of inflammation which is sometimes absent. The sensation of heat in an inflamed part does not appear to depend on any actual accumulation or elevation of temperature measurable by the thermometer, but on the altered state of the sensibility of the nerves implicated in the inflammation; for the sensible heat of an inflamed part rarely indicates more than 98° of Fahrenheit's thermometer.*

The most invariable phenomenon of inflammation is *redness.* It arises from the passage of red blood into the serous capillaries, which either from debility, and consequent relaxation, or from an altered state of their specific sensibility, offer no resistance to the intromission of the red globules of the blood. This redness generally remains after death, and affords one of the ordinary post mortem evidences of inflammation. Redness by itself, however, cannot be regarded as a certain sign of previous inflammation, for the serous capillaries may become injected with red blood in *articulo mortis*, although wholly free from previous disorder. I have already adverted to this fact, and to the erroneous inferences it may lead to, in the preliminary chapter on the pathology of fever.

Swelling is always more or less present in the soft structures, and appears to depend on effusion of serum into the surrounding cellular tissue, and on the dilatation of the capillary vessels. The firmer the structure is, the less swelling will occur from inflammation.

Inflammation is an affection of the capillary system of vessels, and appears to consist of an altered condition of their vital properties, with inordinate sanguineous congestion, and hence the more abundant the capillaries of a part are, the more apt it is to become inflamed. The mucous, serous, cellular, and dermoid structures being peculiarly vascular, are much more frequently affected with inflammation than the osseous, cartilaginous, and tendinous structures.—(Bichat.)

Inflammation may be produced, 1. By the *direct* operation of irritating causes on the animal structure; as wounds, bruises, burns, mustard, cantharides, turpentine, the acids, or various caustic substances. 2. By the *indirect* operation of irritants through the medium of the nervous system. Thus, acid in the stomach will sometimes give rise to superficial cuticular inflammation; and meningeal inflammation is frequently the consequence of irritants acting on the mucous membrane of the intestinal canal. 3. By general increased action of the heart and arteries, as frequently occurs in synochal fever, where any portion of the capillary system is accidentally debilitated, and there-

* Hunter on the Blood.

by predisposed to inflammation. It is in this way that most of the inflammations which occur in fevers arise, for when the momentum of the general circulation is augmented by the increased action of the heart and arteries, the blood will, by its impetus, be forced into those capillaries which, from debility, either accidental or induced by the remote febrific cause, offer less resistance to its intromission than they do in a state of natural vigour. 4. By metastasis; thus, erysipelas sometimes passes in and fixes upon an internal organ; and gout occasionally passes from the feet to the stomach, brain, and to various other parts.

Whatever may be the remote exciting cause of inflammation, it is probable, that the following changes are effected in the progress of its evolution. 1. *Irritation,* that is, a certain inordinate or hurtful impression on the nervous filaments of the part, by which a new and irregular excitement is produced in them, called irritation. 2. *Alteration of the vital properties* of the capillaries of the part thus irritated or disturbed by the unnatural impression; and, 3. An afflux, or, determination of the blood to these capillaries. (Bichat.) These changes often succeed each other so rapidly, that they seem to occur simultaneously. A change in the sensibility and irritability of the capillaries, would seem to be essential to the existence of inflammation; for where these vital properties remain in their normal state, preternatural determination of the blood into them, does not constitute inflammation, but only *congestion,* or local plethora.*

Are the capillaries of an inflamed part in a state of *debility* and *passive relaxation,* and is the velocity of the blood circulating in them diminished, as is contended by Vacca, Lubbeck, Allan, Philip, and Hastings; or, are these vessels in a state of *increased action,* and the momentum of the blood within them augmented, as is maintained by Hunter? Upon these points, there has been a great deal written, both *pro* and *con,* and the subject is still not well settled. My own view on this subject is, that the inflamed capillaries ought to be regarded as being in a state of irritation; and that this irritation may be connected either with an *increased* or *decreased* power of action. In this respect, local inflammation corresponds with that general irritated vascular excitement, which constitutes fever. The heart and arteries are in a state of irritation, *with increased power of acting* in synocha. In typhus, there is also general vascular irritation; but it is connected with *a fundamental debility of the vital powers.* There is, therefore, according to my apprehension, a typhus and a synochal state of local inflammation; and this corresponds with the results we obtain from remedial applications. May we not explain these different *diatheses* of

* Bichat. General Anatomy.

inflammation, by the greater or less degree of *organic injury* sustained by the nervous filaments of the inflamed capillaries? When a part is irritated, so as to *exalt* the sensibility of the capillaries, by exciting their nervous texture, the consequent inflammation will probably be one of *increased* capillary action, and demand sedatives for its cure: when, on the contrary, the irritating cause acts with such violence as to cause structural lesion in the nervous extremities, or when from the long continuance of the inflammation, the capillaries have in some degree lost their energies, the inflammation resulting from its action will be characterized by debility, and demand stimulating applications, as is the case in scalds and burns.

Terminations of inflammation.—Inflammation is said to terminate in *resolution*, when it declines, and disappears without having induced any structural lesion, or perceptible discharge. It consists in a gradual return of the vital properties of the inflamed part to their natural condition, and a consequent resumption by the capillaries of their ordinary or healthy action, before either some portion of the affected parts is destroyed from total loss of vitality, or *new* secretions are formed by the morbid action of these vessels. Termination by resolution is always more prompt, in proportion as the inflamed part is endowed with a higher degree of vitality. (Bichat.) Frequently the termination of inflammation by resolution, is accompanied by an increase of the natural secretions of the affected organ; and this is particularly noticed in the mucous membranes, as in catarrh and coryza, where an increased secretion of mucus always announces the favourable termination of the inflammation. The same fact is also conspicuously exemplified in rheumatic inflammation, which rarely terminates without an increased exhalation of serum into the surrounding cellular structure. *Effusion* is another of the terminations of inflammation. The fluid effused may be either blood, or lymph, or serum. The termination by effusion of *blood*, occurs most commonly from the softer and more vascular structures, more especially from the surface of *mucous membranes*. Lymph and serum are rarely effused from this structure, these effusions being almost peculiar to the *serous* membranes. The *lymph* which is thus effused in the declension of inflammation from serous membranes, often forms a bond of union, and causes firm adhesion between them when contiguous to each other. It is thus that the costal and pulmonic portions of the pleura are so frequently found united, in consequence of thoracic inflammation. In the *mucous* membranes, such adhesions never occur from inflammation; and this is one of those wonderful adaptations in the animal economy, in which the benevolent design of an all-wise Providence is especially conspicuous; for without this peculiarity in the mucous structures, we should be continually

liable to adhesions between the surfaces of the various excretory ducts, as well as of those of the alimentary canal and respiratory passages, since these are more frequently affected with inflammation than any other parts of the animal system. When lymph is effused into the substance of the solid viscera, or into the cavities of the cellular tissue, it causes a consolidation of these parts, forming what are technically called indurations. The spleen, liver, and lymphatic glands, are particularly liable to these consequences from inflammation.

Suppuration, also, is one of the modes in which inflammation is wont to terminate. Of all the animal tissues, the *mucous* and *cellular* are most liable to this mode of termination. The bones and tendons never enter into the suppurative action from inflammation; and the *serous* membranes, though liable to suppuration from inflammation, are much more apt to pour out an increased flow of serous fluid. The product of the suppurative process differs conspicuously in the different structures that are liable to it. In the mucous membranes, the fluid elaborated by this morbid action, consists of a whitish, cream-like, or greenish appearance, denominated pus. In the *serous* membranes, the pus is formed by a kind of exhalation, and consists of a thin, *whey-like* fluid, generally intermixed with flakes of coagulated lymph. Suppuration of the cellular tissue produces a thick pus, of a pale-yellow colour and uniform consistence, exhibiting, under the microscope, the appearance of minute globules suspended in a serous fluid. The grade of inflammation which results in suppuration, transcends that which is necessary for the secretion of lymph; and hence, around the circumference of inflamed parts, involving cellular tissue, where the inflammation is less active than at the central portions, lymph, and not pus, is formed; in consequence of which, the cells adhere to each other around the internal suppurating space, and form a circumscribed cyst or cavity in which the pus is retained, constituting an *abscess*. The occurrence of suppuration in an internal organ, is generally manifested by a sensation of weight in the region of the affected part; a change from an acute to a heavy, dull, and throbbing pain; rigors; a change from a hard, tense, and quick pulse, to a soft and moderately full one; night sweats, and other symptoms of hectic.

Inflammation may also terminate in *gangrene*. This mode of termination never occurs in the cartilages, nerves, and bones; the mucous, cellular, and serous tissues being most prone to it. Of the serous tissues, the *peritoneum* appears to be most apt to become gangrenous from inflammation; and of the mucous membranes, that which lines the alimentary canal is most subject to this termination. The occurrence of gangrene is attended with a sudden cessation of pain; sinking of the pulse; cold extremi-

ties; cold sweat; indistinctness of vision; slight delirium; and a cadaverous expression of the countenance.

The four modes in which inflammation terminates, appear to be determined by four corresponding grades of the inflammation. This is strikingly illustrated in the phenomena of common phlegmon or boil. Along the circumference where the inflammation is weakest, there is serum effused into the surrounding cellular structure; a little further towards the centre, where the inflammation is somewhat greater, lymph is thrown out, and adhesions formed; within this circle, where the inflammation is still more violent, pus is secreted; and at the central portions gangrene and sloughing occur. (Hunter.)

The different forms of inflammation manifest different tendencies in relation to these terminations. In boil and whitlow, there is an especial tendency to suppuration; in carbuncle, the disposition is to terminate in gangrene; and in rheumatism and mumps the tendency is strongly to resolution. Indeed, so strong are these "original dispositions to terminate in one mode rather than in another, that it is very difficult to procure any other termination than the one to which the tendency exists."*

Inflammation occurs under five prominent modifications, corresponding to the five elementary tissues, viz. the cellular, the serous, the mucous, the dermoid, and the fibrous.

1. Inflammation of the cellular tissue or phlegmonous inflammation is characterized by great swelling, throbbing pain, and by its peculiar mode of suppurating—the pus being collected in circumscribed cavities.

2. Inflammation of the serous structures, or serous inflammation, is distinguished by very acute *lancinating* pain; little or no tumefaction; much sympathetic reaction of the sanguiferous system; by its tendency to terminate in the exudation of coagulable lymph or serum, or the secretion of a thin, whey-like pus. It is peculiarly rapid in its course, and is not apt to terminate in gangrene. Adhesions are peculiar to this and the former modification of inflammation.

3. Inflammation of the mucous tissues or mucous inflammation, is attended with a burning or stinging pain; without tumefaction of the subjacent cellular structure; the sympathetic fever attending it is not vehement; and it never terminates in resolution, without an increase of the mucous secretion.

4. Inflammation of the dermoid system, or erysipelatous inflammation, is attended with a burning pain; it spreads irregularly over the surface of the skin, forming vesicles or blisters, containing a transparent straw-coloured serum, and never forms

* Observations on the Nature and Treatment of Inflammation. By J. H. James, p. 17.

adhesions, or suppurates in circumscribed cavities. This variety of inflammation generally depends on constitutional causes, and it would seem, in some instances, on a specific cause.

5. Inflammation of the fibrous structures, or rheumatic inflammation, is accompanied with intense aching or gnawing pain; and is particularly indisposed to terminate in suppuration or gangrene—its almost universal termination being in the exudation of serum and a gelatinous fluid, or in the deposition of earthy matter. It is apt to change its situation from one place to another, and sometimes passes suddenly to the internal organs. The sympathetic fever which accompanies its acute form is always very vigorous. This modification of inflammation rarely proves fatal, unless by metastasis to organs essential to life.

The existence of internal inflammation is ascertained by the pain continuing without much remission ; the appearances of the blood, which when drawn, very generally exhibit a sizy or buffy crust on the crassamentum ; by the presence of fever, which does not attend spasmodic or nervous pain; by the effects of *external pressure*, more especially in abdominal inflammation, —thus causing an aggravation of the pain, or a feeling of great soreness,—whilst in spasmodic pain, a mitigation of the patient's sufferings is usually the consequence of pressure. The effects of position also throw light on the diagnosis of internal inflammation ; thus, in abdominal inflammation, the patient lies on his back, with the knees drawn up, and the head and shoulders raised, in order to obviate pressure from the tension of the abdominal muscles. The character of the functional derangements, moreover, will assist us in ascertaining the existence of internal visceral inflammation ; and, finally, the nature of the exciting causes will aid us in the diagnosis.

Inflammation occurs under two principal varieties, in relation to the rapidity of its progress and the violence of its phenomena —namely, *acute* and *chronic* inflammation. The former is rapid in its course, and violent both in its local and symptomatic phenomena. The latter is generally, though not always, the consequence of the former, and is characterized by a slow progress, and much less intensity in all its symptoms. In the serous membranes, chronic inflammation results either in the effusion of serum, giving rise to dropsical accumulations, or to a gradual change of structure, such as thickening and induration, and frequently to the formation of miliary tuberculous matter. In the mucous tissues, the usual consequences of this variety of inflammation are phthisis, diarrhœa, dyspepsia, and various other local and general affections ; and in the solid viscera and glandular structures, induration, scirrhous, and other organic changes are its effects.

To the pathologist and medical practitioner, the sympathetic

phenomena of inflammation constitute one of the most interesting and important objects of attention. Among the multifarious febrile affections that are met with in practice, whether acute or chronic, there are comparatively but very few in which local inflammation does not exist in some organ or structure; and, although in the majority of instances, these inflammations are secondary, or developed after the commencement of the fever, their influence in protracting the disease, and aggravating its phenomena, is, perhaps, not the less conspicuous. Whenever febrile irritation becomes much protracted or chronic in its course, we may infer, with little chance of mistake, that there exists some obscure focus of inflammation in an internal part. Pure idiopathic or general fever, without the accessory irritation of local inflammation, can never continue very long. Mere morbid excitement, from general causes or moveable irritants, is generally soon overcome by the organic, or what has been called the sanative actions of the animal economy.

CHAPTER IX.

OF THE PHLEGMASIÆ OF THE ALIMENTARY CANAL, AND ITS ACCESSORY ORGANS.

Sect. I.—*Of Glossitis.*

Acute inflammation of the tongue is not a frequent disease; but when violent, it is a very severe, and often rapidly fatal affection. It usually begins with a burning and throbbing pain in the tongue, attended with febrile symptoms, which soon rise to a high synochal grade. The tongue soon becomes hot, dry, red, and swollen, the swelling generally increasing rapidly, so that in a few hours it fills almost the whole cavity of the mouth, and is often thrust out between the teeth, appearing like a mass of raw flesh. The respiration becomes extremely difficult, and a horrible sense of impending suffocation is experienced. The patient can neither move the tongue nor swallow. In some instances suppuration takes place; and one or more small abscesses are formed in the substance of the tongue, which are seen pointing on some part of its surface at the same time that the pain and swelling subside. Instances have occurred in which mortification of the tongue has taken place, or partial sloughing of its substance; and the inflammation has been known to termi-

nate in induration of its structure.* The tongue occasionally swells so rapidly, and greatly, as to occasion death by suffocation in a very short time. I have known a case terminate fatally in less than twelve hours from the commencement of the disease.

More or less inflammation of the tongue generally accompanies laryngitis; and it occurs also occasionally in cynanche tonsillaris; but in instances of this kind, the inflammation and tumefaction of this organ scarcely ever become very considerable. Glossitis may arise from the operation of local irritating causes on the tongue; such as acrid substances taken into the mouth; wounds; bruises; the sting of an insect; scalding; calculous concretions in the salivary ducts. It may also be produced by atmospheric vicissitudes, or the influence of a cold and damp atmosphere. Dr. Hosack relates a case which was caused by sitting in a current of cold air, immediately after being much heated by exercise. Reil states that glossitis has occurred epidemically;† and Stark has known it to come on periodically, in consequence of suppressed menstruation.‡

Treatment.—General blood-letting, promptly and decisively practised, followed by the application of leeches along the margin of the lower jaw, and, if practicable, to the lower surface and extremity of the tongue, are indispensable remediate measures in this affection. Much advantage may also be derived from scarifying the anterior part of the tongue; and still more from making an incision into its substance along the middle. This practice was particularly recommended by de la Motte§ many years ago; and in a late number of the Edinburgh Medical and Surgical Journal, an interesting case is related by Mr. Martin, which was successfully treated by incisions.‖ Reil also, (*loc. cit.*) speaks strongly in favour of *superficial* incisions, from an inch and a half to two inches in length, along the middle of the tongue. The bleeding must be promoted by emollient gargles. Richter says, that the swelling generally subsides

* Richter's Specielle Therapie. Band. i. p. 497.

† Fieberlehre, tom. ii. p. 411.

‡ Handbuch zur Kennt. und Heil. der innern Krankh. p. 140.

§ Med. de l'Acad. de Chirurg. tom. v.

‖ The tongue, in this case, "increased in size until it protruded from the mouth, and separated the jaws. The organ was smooth, hard, and covered with a thick coating of viscid saliva. The patient was bled to 30 ounces, with some relief—and the same quantity of blood was taken in an hour after, which enabled him to articulate distinctly. In three hours more, the swelling had increased,—respiration through the mouth was impracticable, and that through the nostrils was difficult—in short, suffocation was threatened. A deep incision was made in the most prominent part of the right side of the tongue, from whence issued a quantity of blood and pus, with evident relief. Two other incisions were made when the first ceased to discharge blood. In a quarter of an hour after the first incision, the patient could articulate distinctly—respiration was free. Next day he was nearly well."—*Med. Chir. Rev. October*, 1827.

speedily after the incisions; and they readily heal without any disagreeable consequences. From the impossibility of swallowing, internal remedies cannot be employed. Laxative enemata, however, are very useful, and should be frequently administered until the bowels are well evacuated. Considerable benefit may also arise from a large blister laid on the back of the neck or on the throat, after proper general and local depletion has been employed.

Sect. II.—*Of Tonsilitis.—Cynanche Tonsillaris.—Quinsy.*

In this variety of angina, the inflammation is seated in the tonsils, soft palate, and fauces, and is of a strictly phlegmonous character. In cold and variable climates, it is a disease of frequent occurrence, and although by no means so dangerous a malady as the anginose affections of the respiratory passages, it is much more painful, and in violent cases always alarming, and sometimes fatal.

Symptoms.—The disease usually begins with slight chills, succeeded by a high grade of febrile reaction, accompanied with an uneasy feeling in the fauces, and more or less pain in this part on swallowing. In a few hours, a fixed pain is felt about the region of the tonsils, and the act of deglutition becomes more and more painful, until at last it is attended with extreme suffering, or altogether impossible. On examining the throat, one or both tonsils are found very much swollen, and the whole surface of the fauces very red and somewhat tumefied. The tongue also is swollen, white, and covered with a thick layer of transparent viscid mucus. The face is red and tumid; the carotids beat strongly; respiration is difficult; hearing obtuse; the pulse frequent, hard, and full; and the voice is indistinct or whispering. In general, much more difficulty and pain is experienced in swallowing liquids than soft or pultaceous solids. The pain generally shoots from the fauces into the ears, particularly on attempting to speak or to swallow, and the mouth is opened with great difficulty and pain. A very thick ropy mucus commonly adheres to the inflamed parts, and contributes much to the difficulty of respiration. The uvula and soft palate, are generally very much swollen; but the principal pain and difficulty of breathing arise from the tumefied tonsils; for when both are inflamed, they sometimes become so much enlarged as to come in contact with each other, confining the tumid uvula behind them, or pressing it forwards into the mouth.* The external part of the throat, in

* We may be sceptical, however, with regard to the assertion of Marcellus Donatus, who affirms that he has seen the uvula thus pressed forwards by the swollen tonsils, *ad anteriores usque dentes.—De Medica Historia Mirabili*, p. 84.

the region of the tonsils, is always somewhat tumefied, and tender to the touch. In some instances, the tonsils are covered with flakes of coagulable lymph, of a whitish colour, resembling superficial sloughs. Occasionally small excoriations or ulcerations occur on the inflamed tonsils. These ulcers arise from small yellowish pustules bursting and pouring out a lymph-like fluid, which concretes into a whitish pseudo-membranous layer on the surface of the tonsil. This, after some time, separates, and exposes a bright red and very sensible surface or erosion, from which a purulent matter is discharged.*

The inflammation in this affection terminates either in resolution or suppuration, gangrene being an extremely rare occurrence. In no structure is inflammation more apt to terminate in abscess, than in the tonsils. Internal suppuration often occurs in a few days, notwithstanding the most active local and general antiphlogistic measures. The quantity of matter discharged from a suppurated tonsil is seldom so abundant as to become very perceptible in the sputa, a portion of it, no doubt, being commonly swallowed with the saliva. Cases occur, in which the abscess, instead of breaking internally, is gradually enlarged; and extending outwards, points externally under the angle of the jaw. Dodonæus relates a case, in which the patient appeared near dying, where speedy relief was obtained by an external incision into the abscess, and the consequent discharge of a large quantity of pus.† Frequent attacks of the disease are apt to produce permanent enlargement and induration of the tonsils. In some instances the inflammation passes down into the larynx, an occurrence which always greatly increases the dangerousness of the affection.

Causes.—Some individuals are peculiarly predisposed to this variety of angina. This is especially observed in persons who have already once or twice suffered an attack of the disease. The constitutional influence of mercury, or salivation, appears to create an increased aptitude to this affection; a strumous habit, also appears to constitute a state of predisposition to the disease.

The ordinary exciting cause of this complaint is cold and damp air, or cold applied in any manner so as to give a sudden check to the perspiration. Standing long on cold and wet ground, is particularly apt to give rise to the disease in those who are predisposed to it. It may also arise from local causes, such as irritation from the cutting of one of the posterior teeth; (Sachse, loc. cit. p. 475;) the fumes of arsenic; (Sheffler, von. d. Gesundh. der Bergleute,) acrid substances, swallowed or applied to the fauces. (Fabricius, cent. iv. obs. 15.)

* Dr. W. Sachse, Encyclopädisches Wörderbuch der Medicinishen Wissenschaften. Band. ii. p. 464.

† Obs. Med. p. 192, as quoted by Van Swieten.

Treatment.—The treatment must be vigorously antiphlogistic; and although Cullen asserts that a copious abstraction of blood is seldom necessary, general experience is decidedly in favour of prompt and efficient bleeding in this affection. In slight cases we may sometimes subdue the inflammation without blood-letting, but as we cannot be sure, at first, whether the disease will continue a mild course, or acquire much severity, it is always best at once, to moderate the momentum of the circulation by depletion. Local bleeding, by scarifying the tonsils, generally produces excellent effects, and may be accounted much more efficacious than the application of leeches to the throat or under the ears.* Cupping on the back of the neck and under the ears may also be resorted to with benefit. Baglivi asserts, that he has known the abstraction of blood by cupping between the shoulders, afford great advantage in this affection. Internally, purgatives and the usual antiphlogistic diaphoretic remedies must be actively employed. An active purge should be one of the first remediate measures adopted; the bowels must afterwards be kept freely moved, either by the daily repetition of purgatives, or frequent laxative enemata. A bolus of calomel and jalap, or of from fifteen to twenty grains of the compound extract of colocynth, with ten grains of calomel, or a full dose of one of the neutral purgative salts, may be used for this purpose.

Nitre with antimony, in the usual proportion of the nitrous powders, constitutes the best refrigerant diaphoretic in this complaint. Some advantage may be gained by placing the nitre on the tongue, and swallowing it as it is gradually dissolved in the mouth. The muriate of ammonia, dissolved in water with the extract of liquorice, has also been particularly recommended.† Much benefit may in general be derived from nauseating doses of tart. emetic. I have frequently prescribed this remedy with the happiest effect. A grain of tart. antim. may be dissolved in two ounces of water, of which a tea-spoonful is to be taken every half hour, so as to keep up a considerable degree of nausea for several hours.

Emetics were formerly a good deal employed in this variety of angina, but their effects are much less beneficial in this, than in any of the other anginose affections.

As soon as the momentum of the circulation has been moderated by venesection, a blister should be applied to the throat, or on the back of the neck. In slight cases of the disease, rubefacients, particularly the spirits of turpentine, or a liniment com-

* Kopp, an eminent German physician, says, that blood drawn from the tonsils by scarification, is the best, most certain, and promptest remedy we possess in this affection.

† Loeffler. Beiträgen zur Arzn. Wissensch. 1. Th. Leips. 1791, p. 142.

posed of two parts of aq. ammoniæ to one of sweet oil, will in general suffice for this purpose.

Emollient poultices also, are very useful applications in simple cases of the disease. When employed as soon as the disease commences, together with warm pediluvium, and a purgative, the further progress of the inflammation will sometimes be speedily and effectually checked. In such instances three or four folds of thick flannel round the neck, with the auxiliaries just mentioned, are sufficient frequently to prevent the development of the malady. In all instances, however, where the inflammation is considerable, vesication is decidedly the most proper.

Various gargles and other applications to the seat of the inflammation have been recommended in this affection. Cullen advises a decoction of oak-bark, with alum dissolved in it, as a gargle in this disease. I have generally preferred using simply warm water, slightly acidulated with vinegar, for this purpose. Little or no advantage results from the use of gargles in this complaint, beyond that of dissolving and removing the viscid mucus which is apt to adhere to the tonsils and palate, and this is best effected by warm water, either alone, or with a portion of some vegetable acid, and perhaps honey. Pringle states that he never derived any benefit from astringent gargles; and Storch asserts, that he has known them to do very evident harm, by checking the exhalation and secretion from the mucous surface of the inflamed parts. The inhalation of different vapours, is one of the oldest remedies in this disease. Hippocrates used the vapour of vinegar and water for this purpose.

When the inflammation has terminated in the formation of a tonsillar abscess, it should be pierced with a lancet, to give exit to the matter, an operation which always gives immediate relief from the pain and difficulty of respiration. After the pus is discharged, the patient should continue the use of some mild and slightly acidulated or astringent gargle.

Sect. III.—*Of Parotitis.*

Mumps.

Parotitis is a specific inflammatory affection, capable of being propagated by a peculiar contagion, and occurring sometimes epidemically.

The disease usually commences with slight febrile symptoms, with a feeling of stiffness of the jaws, and a little swelling and pain either in one or both parotid glands. The swelling gradually increases until about the fourth day from the beginning of the disease, at which time the affected gland is greatly swollen

and very firm and tender to the touch. The skin on the tumour is generally of a natural colour, or but slightly inflamed; although, in some instances, a pale redness is diffused over the swelling. Mastication and deglutition are always attended with considerable pain. The fever is generally mild, and is often attended with considerable nervous irritability and restlessness. From about the fourth day the swelling gradually subsides until the detumescence is complete, which is generally about the seventh day. Soon after the inflammation of the parotids begins to decline, the breasts in females, and the testicles in males, are apt to become much swollen and hard. The subsidence of the disease is usually attended with more or less general diaphoresis, and a red sediment in the urine.

In general, parotitis is neither a severe nor a dangerous affection—more especially when the patient keeps the affected parts moderately warm, and avoids exposing himself to the injurious influence of variable or low temperature. In some instances, however, a sudden metastasis of the inflammation takes place to the brain, or to the testicles, or the mammæ—and this is generally occasioned by the patient taking cold. When it passes to the brain, insensibility, coma, or furious delirium usually supervenes, and death sometimes occurs in a few hours. I have known a case of this kind terminate fatally in less than an hour under a paroxysm of violent convulsions. When the disease thus suddenly falls on the testicles, and the case is not judiciously treated, suppuration of these parts may take place—an occurrence always exceedingly painful and sometimes ultimately fatal. The inflammation of parotitis, however, has no tendency to terminate in suppuration; yet, when circumstances favourable to this termination supervene, it does sometimes take place in the parotids, as well as in the external parts, to which it may be transferred.

Children and young persons are most liable to this affection—its occurrence in middle and advanced age being very uncommon. It very rarely occurs more than once in the same individual, and resembles in this respect the other acute contagious maladies.

Treatment.—In mild cases, little more is necessary than keeping the bowels open, and using gentle diaphoretics. The parts should be kept warm—great care must be taken to avoid taking cold. When the inflammatory symptoms are violent, an active antiphlogistic treatment is necessary. When the swelling disappears in the neck, and shows itself in the testicles, a blister should be laid on the parotids, and every effort made to excite a general diaphoresis. To discuss the hard swelling which sometimes remains after the inflammatory symptoms have disappeared, frictions on the tumour, with mercurial ointment, spirits of camphor, or rubefacient liniments, should be used.

Of Inflammation of the Alimentary Canal.

Inflammation of the mucous membrane of the alimentary canal, has, of late years, attracted more attention, than, perhaps, any other phlegmasial affection. The French pathologists, in particular, have investigated this subject extensively, and most minutely. Whether their peculiar views concerning the connexion of this local affection with general fevers, be correct or not, it cannot be doubted, that it is pre-eminently entitled to the attention of the pathologist and practitioner. I have already frequently adverted to the great tendency of some forms of fever to give rise to mucous inflammation of the alimentary canal; and the practitioner who does not attend to this circumstance, will incur a liability to defeat in his remediate efforts, which cannot be justified in the present state of pathological science. It is, indeed, of the utmost importance, that the medical practitioner should make himself familiar, not only with the general fact just referred to, but especially with the various phenomena, both primary and secondary, of gastro-enteric inflammation. It is not, however, our purpose, in this place, to treat of this affection in reference to its connexion with idiopathic fever. The disease is here considered as a primary affection—the immediate and only cause of the general symptoms which accompany its course, and which necessarily cease with the cessation of the local inflammation.

Sect. IV.—*Of Acute Gastritis.*

Symptoms.—Acute inflammation of the mucous membrane of the stomach, commences sometimes with violent vomiting and purging, attended with a burning or lancinating pain in the stomach. In some instances, a prickling pain and soreness in the pharynx, without much gastric irritability, are the first symptoms of the disease; and occasionally it begins with great tenderness in the epigastrium, nausea, retching, and vomiting. In nearly all instances, frequent and painful vomiting, especially immediately after swallowing warm liquids, is a prominent symptom. The desire for *cool* drinks is generally extremely urgent; but the aversion to *warm* liquids is almost equally strong. After each spell of vomiting, the patient usually experiences a temporary abatement of the gastric distress; and a similar transient alleviation often follows the reception of cool and bland liquids into the stomach. Warm drinks, on the contrary, rarely fail to aggravate the pain and vomiting, as soon as they arrive in the stomach. In some cases, there is considerable difficulty of swallowing, on account of the contracted and irritable state of the upper orifice of the stomach. Oppressed and anxious respiration

occurs in many instances, from "the inflamed state of the stomach rendering the descent of the diaphragm painful." (Broussais.) The brain occasionally sympathizes strongly with the inflamed stomach. Broussais has seen patients in this disease "as completely delirious as in fevers of the most malignant character, or phrenitis." The delirium, in such instances, is almost always greatly subdued, for a short time, by a draught of cold water. Acute gastritis is generally attended with great depression of spirits, and prostration of strength; and the pulse, though at first moderately full, soon becomes very contracted, quick, and tense, and at last so small as scarcely to be felt. A short and painful cough attends in some cases, and the voice usually becomes much altered, and sometimes entirely extinct from paralysis of the laryngeal muscles. The aspect of the countenance is expressive of great anxiety and suffering, or of despondency and despair.

When the inflammation is confined to the stomach, the bowels are constipated; but where the colon becomes involved in the disease, diarrhœa, or tenesmus, with dysenteric discharges, attend. The skin is dry, and generally hot; and the tongue often red and clean, or covered with a thick layer of white fur along the middle, with a red and granulated border. Towards the conclusion of fatal cases, hiccough, faintings, cold extremities, slight delirium, coma, and cold clammy sweats occur.

Such are the more prominent symptoms which usually attend this affection. Acute gastritis does not, however, always manifest itself by these unequivocal phenomena. In some instances, the inflammation is developed, and proceeds to fatal disorganization, in so obscure and insidious a manner, as to present scarcely any of the ordinary manifestations of its existence. Dr. Abercrombie* justly observes, that the symptoms which attend acute inflammation of the stomach, are liable to great uncertainty. The records of medicine furnish us with many instances, in which the most striking traces of previous inflammation were detected in the stomach on post mortem examination, but which exhibited none of the symptoms by which the presence of this affection is usually ascertained.

I have recently met with a case, in which the patient complained of intense pain in the head, with occasional slight delirium, transient darting pains through the chest, nausea, with an indescribable feeling of distress in the epigastrium; a frequent, firm, and contracted pulse; but without any actual pain in the stomach, or other symptoms that could be regarded as characteristic of gastritis. The patient, in the course of five days, sunk under his malady. On post mortem examination, nearly the whole internal

* Pathological and Practical Researches on the Diseases of the Stomach. Edinburgh, 1828.

surface of the stomach was found minutely injected, and large patches of the mucous membrane were softened, abraded, and, in some parts, very conspicuously thickened, and of a yellowish ash-grey colour. No other local affections, whether in the abdomen, thorax, or head, were noticed.

Diagnosis.—Acute gastritis, in its ordinary developed character, may be distinguished from cramp and flatulent pains, by the following distinctive circumstances. In gastritis, the pulse is small, tense, and quick; in spasm, or flatulent pains, it is generally full, or nearly natural. In gastritis, violent vomiting generally occurs, particularly after taking warm fluids into the stomach. In spasm, vomiting rarely takes place, and warm drinks do not readily excite or aggravate it. The pains seldom intermit in gastritis, except immediately after taking some cool and bland fluid into the stomach, or for a few moments after vomiting. In spasm, the pain often intermits wholly for several minutes, independently of the effects of cool drink or vomiting. In gastritis, the patient almost always lies on his back, and moves himself as little as possible. In cramp, he sits up or walks about, with the body bent forwards, or throws himself about on the bed. The pain in gastritis is burning and lancinating; in spasm, it is heavy, twisting, aching, and extremely severe. In gastritis, the skin is hot and dry; in spasm, it is usually moist, and rather cool. In gastritis, finally, pressure on the epigastrium is attended with a sense of great soreness, and an increase of the pain; in cramp, pressure generally affords some relief from the violence of the pain.

Causes.—Substances of an irritating or corroding character, received into the stomach; cold water rapidly swallowed when the body is heated, and in a state of free perspiration from fatiguing exercise; over distention of the stomach by stimulating or indigestible food; stimulating drinks; the external application of cold; the suppression of habitual sanguineous discharges; metastasis of rheumatism and gout; external mechanical injuries of the epigastrium;—all these causes may give rise to acute gastritis.

Besides the foregoing *manifest* causes of acute gastritis, there are others of an *occult* character, which appear to possess a specific tendency to excite inflammation of the stomach. Of these, the *miasm* which produces yellow fever is the most remarkable. Acute gastritis occurs also, very frequently, in other forms of malignant fevers, particularly in the putrid typhus of warm climates.

Prognosis.—A gradual subsidence of the pain, and disposition to vomit, accompanied with a lateritious sediment in the urine, spontaneous feculent alvine discharges, a gentle moisture of the skin, and a more developed, compressible pulse, indicates

a favourable termination. When, on the contrary, the pain and vomiting continue with unabated violence for several days, with difficulty of respiration and hiccough, the pulse becoming smaller, more frequent, and corded, the worst consequences are to be dreaded. If, after the symptoms have continued in this progressive course of aggravation, the pain suddenly subsides, and the extremities become cold and clammy, with dimness of sight and slight delirium, a fatal termination is inevitable.

Post mortem appearances.—In some instances of great violence, the disease proves fatal before gangrene or disorganization has taken place in the inflamed mucous membrane. Broussais thinks, that in such cases death takes place "from the sole effects of *pain*, and before the inflamed texture is broken down or sensibly altered in its composition. Those who had died in the early stage of the complaint, frequently showed nothing more on dissection than discoloration, without erosion or ulceration of the mucous membrane." In the majority of fatal cases, however, the mucous membrane presents strong marks of disease. It is frequently thickened, dense, and minutely injected, "exhibiting the character of ecchymosis;" erosion and ulceration also are a common occurrence, and in many cases different parts of this membrane are in a softened or broken down state, and of a pale yellow or dark brown colour.

Treatment.—Bleeding, here, as in the other phlegmasial affections, stands at the head of our remediate means. The smallness and frequency of the pulse must not deter the practitioner from the use of the lancet. On the contrary, when the existence of acute gastric inflammation is unequivocal, this contracted state of the pulse ought to be regarded as the most urgent indication for prompt and copious depletion. In general, all the symptoms remit after an *efficient* abstraction of blood. The remission, thus procured, is however seldom of long duration—an exacerbation usually coming on in an hour or two, demanding a repetition of the use of the lancet.* Next in importance to prompt and copious bleeding, is the application of *leeches*, followed by a large blister over the epigastrium. When leeches cannot be had, a vesicatory, sufficiently large to cover the whole epigastric region, should be at once applied; for as four or five hours must elapse before the blister can inflame the skin, sufficient time is allowed to moderate the momentum of the circulation,

* Broussais does not seem to place a great deal of reliance on the employment of venesection in this affection. "La saignée," he observes, "n'eteint point un phlogose de l'estomac, comme elle emporte un peripneumonie, et qu'elle est inutile sans le concours des emolliens. J'ai eu assez lieu de me convaincre que les évacuations sanguines sont d'un bien faible sccours *dans les inflammations des organes plats et membraneux, lorsque ces tissues ne sont point appliqués sur un paranchyme.*"—Phlegmas. Chron. vol. ii. p. 20.

and the general phlogistic state of the system, by prompt and copious depletion, to obviate any injurious consequences from the general stimulating effects of the blister. The blister should be dressed with mercurial ointment.

The ordinary internal antiphlogistic remedies, such as nitre, antimonials, and catharties, are entirely inadmissible in this affection. Considerable advantage may be obtained from the free use of mild mucilaginous drinks, such as flaxseed tea, infusion of althea, or of marsh-mallows, or of the common *malva rotundifolia* of this country, thin barley-water, or a solution of gum arabic in water. I have used an infusion of the slippery-elm bark, in a few instances, with much apparent advantage. The *vegetable* acids, diluted with some bland mucilaginous fluid, sometimes relieve the gastric distress considerably, more especially the lemon-juice. Broussais says, that "orange-juice diluted in water forms an excellent drink in this disease. The *mineral* acids are always injurious.

Costiveness must be obviated by laxative enemata ; and this should be particularly attended to, throughout the whole course of the disease. For this purpose, we may use the following :

℞. Ol. ricini ℥jj.
Sapon. venet. ℥j.
Infus. sem. lini. ℥viii. M. fiat enema.

Opium is a valuable remedy in this affection. After the general phlogistic condition of the system has been considerably moderated by venesection, full doses of opium rarely fail to allay the pain and vomiting, and to excite a general and salutary action of the cutaneous exhalents. "Opium," says Dr. Armstrong, "when given in health, constipates the bowels ; but this is so far from being the case in gastritis and enteritis, that it tends to assist the action of purgatives, and when exhibited in conjunction with proper depletion, it may be fairly accounted one of our best remedies. The two most remarkable effects of full doses of opium in gastritis, are relief of the pain and reduction of the pulse ; so that the patient often falls asleep shortly after their exhibition, and the pulse which had been previously small and quick, will become full and small." Some writers recommend the use of this narcotic in combination with calomel in the present disease. "Pills, with a grain of calomel and a grain of opium, administered three or four times daily, will be found sometimes to allay pain and arrest inflammatory action in acute gastritis."* I have myself, sometimes employed this combination with great advantage. When opium is employed in this affection, it ought to be given in large doses, and repeated so as to keep up a continued impression on the system. In two of

* A Compendium of Theoretical and Practical Medicine. By David Uwins, M. D. 1828.

the most decided cases I ever saw, two grains of opium were administered every three hours, until eight grains were taken, and with the happiest effects. Efficient blood-letting, both general and local, should always be premised to the employment of this narcotic.

During convalescence from this disease, the utmost care is necessary to avoid taking solid and stimulating articles of food and drink. Nothing but the blandest liquid nourishment should be allowed—such as oat-meal gruel, boiled milk, barley-water, beef or chicken-tea, or preparations of arrow-root, sago, rice, or tapioca.

Sect. V.—*Of Chronic Gastritis.*

Chronic inflammation of the mucous membrane of the stomach is one of the most common phlegmasial affections. The worst forms of dyspepsia, and all that host of inveterate gastric and bilious disorders of which so much is heard, and the true nature of which is so often misunderstood, are in nine cases out of ten the consequences of a chronic inflammatory condition of the lining membrane of the stomach. The slow and insidious progress of this grade of gastric inflammation during its early period, is indeed well calculated to elude observation, and to lead to a misapprehension of its true character. In many cases the first symptoms are those which usually characterize indigestion —such as acidity, flatulence, a sense of heaviness and oppression after eating, eructations, and transient slight pains in the region of the stomach. When the stomach is empty the patient feels easy, but generally languid and dissatisfied, and often tormented with a craving and capricious appetite for food. As the disease advances, the epigastrium becomes somewhat tense, and sore to the touch, and nausea or vomiting is apt to occur an hour or two after taking food. The gastric distress gradually becomes more and more troublesome, particularly after eating; the patient complaining of a constant distressing sensation, amounting sometimes to actual pain in the epigastric and right hypochondriac region. The pain in the stomach is generally confined to a circumscribed spot, and is of a lancinating and stinging character. A sensation of pressure against the diaphragm, as if by a large ball, is occasionally experienced by some patients, whilst others complain of a feeling, as "if a bar were fixed across the stomach, preventing the passage of food or drink into the stomach." (Broussais.) In some instances, a fluid resembling the white of eggs is copiously thrown up from the stomach, and many complain of a constant and most painful feeling of pyrosis. (Abercrombie.) Andral mentions a case in which four pints of a glairy

fluid were thrown up every twenty-four hours, without any portion, either of the food or drinks she took, coming off with it. In the advanced periods of the disease, the appetite almost always fails entirely, and in very aggravated cases "there is a general abhorrence of food." Costiveness almost universally attends the disease in the first periods of its progress; but in many instances diarrhœa ultimately ensues, accompanied with tormina, and, sometimes, with mucous and bloody stools, and more or less tenesmus. The patient is generally dejected, morose, impatient, of an irritable temper, and "but little disposed to enter into a detail of his sufferings." In general, the cheeks and prolabia are of a deep red colour, the tongue is often clean, smooth, and of a vermillion tint over the whole anterior surface, or red and granulated, "somewhat like the points upon a strawberry, with deep fissures, or covered with a streak of brown fur along the middle, with red and clean edges. In the advanced stage of the disease, emaciation always goes on rapidly, the cellular and adipose structures becoming almost entirely absorbed; in inveterate cases the skin is brown, inclining to yellow, and is drawn tightly over the muscles, sinking into their interstices, so as not to be pinched up without much difficulty, even where it usually is most relaxed. (Broussais.) In some instances a slight cough attends, but the function of respiration is rarely much disturbed. The pulse is generally quick, and more or less tense, though not often accelerated in the beginning, except soon after eating; but in the latter periods it becomes contracted, hard, and frequent. There generally exists much muscular prostration, and great indisposition both to bodily and mental exertion. The disease often continues for many months, gradually acquiring strength as it advances, until the system becomes exhausted under a wasting and slow irritative fever, and life is extinguished.

Chronic gastritis is not always marked by symptoms so conspicuous as to render its existence very obvious. The inflammation sometimes proceeds in so obscure a manner as to terminate in fatal disorganization, with scarcely any accompanying manifestations of a serious import. I attended a child which appeared to labour only under trifling gastric derangement, with occasional slight febrile exacerbations. Death occurred unexpectedly in the third week of its indisposition; on dissection, a large circular spot of the mucous and muscular coats of the stomach was entirely softened and broken down, and of a yellowish-grey colour. Andral has related several cases illustrative of the insidious progress of this malady. In one case, no suffering or uneasiness in the stomach was complained of by the patient until about eighteen hours before death.

In some cases, after a few weeks, or perhaps months, of slight uneasiness in the stomach, sudden vomiting with prostration

and violent pain in the epigastrium occurs, and speedily terminates in death, *under symptoms of peritonitis*, in consequence of the unsuspected inflammation in the stomach perforating its coats, and giving exit to its contents into the cavity of the abdomen. When the inflammation terminates in perforation of the stomach, death generally occurs from the sudden supervention of peritonitis. In such cases, after an indefinite period of gastric disturbance, sudden and extremely severe pain occurs in the epigastrium, attended by vomiting or retching, "as if some acrid poison had been taken into the stomach." Chronic gastritis is frequently connected with more or less phlogosis of the superior portion of the intestinal tube.

Causes.—Chronic gastritis may be the consequence of the acute form of the disease; but it is much more commonly the result of irritating substances acting immediately on the internal surface of the stomach;—such as indigestible, heating, or irritating articles of food, and condiments; acrid medicinal substances; insufficient and innutritious articles of food in conjunction with habitual exposure to damp and cold situations, or mental despondency; the intemperate use of alcoholic liquors; repelled cutaneous eruptions; suppressed habitual discharges; neglected or ill-managed dyspepsia.

The depressing mental emotions, if they do not actually excite the disease, are among the most powerful *predisposing* causes of this distressing malady. The united influence of despondency and crude innutritious food, appears to be peculiarly apt to give rise to this grade of gastric inflammation. The development of the disease is often very gradual, commencing in mere debility of the digestive powers, which without great attention to dietetic rules, leads to irritation, and finally to chronic inflammation of the internal surface of the stomach. Over distention of the stomach by food or drink, especially when habitual, and when the ingesta are of a stimulating character, is a common source of this affection.

Diagnosis.—In its early periods, chronic gastritis may be readily mistaken for dyspepsia; for its symptoms often differ but little from those which occur in the latter disease. When, however, the patient feels considerable pain *in a particular spot*, followed by vomiting soon after eating, and a severe feeling of pyrosis attends, with redness and tenderness of the tongue and throat, and the patient becomes much weakened and emaciated, we may reasonably suspect the existence of chronic gastritis.

Considerable difficulty often exists, in distinguishing chronic gastritis from *gastralgia*—a neuralgic affection wholly unconnected with inflammation. There can exist no doubt that this malady has been frequently mistaken for chronic gastritis; and as the modes of treatment appropriate to each are diametrically

opposite, it is manifestly of the utmost importance to learn to distinguish them from each other.

Mr. Barras has published some interesting observations on gastralgia, and on its liability to be mistaken for *chronic gastritis*. He gives the following, among others, as diagnostic symptoms between these two affections.*

1. "In *chronic gastro-enteritis*, the pain is generally *obtuse;* often felt only on pressure; is never absent. *Gastralgic* pain, on the other hand, is often extremely violent; is often, when most violent, relieved, rather than increased by pressure. It often radiates from the epigastrium towards the thoracic parietes, the back, and the shoulders; is of an intermittent character, sometimes entirely disappearing, to return with more or less violence.

2. In *chronic gastritis*, the tongue, which is generally *red on the sides and at the tip*, is covered in the middle with a kind of dry mucous crust, resembling a false membrane; the breath is fetid, with a bitter taste in the mouth; there is thirst. In *gastralgia* the tongue is white; saliva abundant; no thirst, but sometimes a repugnance even to liquids.

3. In *gastritis*, the appetite is *always* bad, and sometimes amounts to a universal disgust for every kind of food. In *gastralgia*, the appetite is variable, null, slight, natural, often greater than in health.

4. In chronic gastritis, the ingestion of a small quantity of food renews the patient's sufferings; excites a febrile movement in the system, and the digestion is always imperfect. There is often rejection of the food by vomiting, a little time after eating; or if there be no vomiting, the patient is oppressed during the digestive process, with a sense of weight, distention, nausea, acid, or acrid eructations, and irritation of the bowels, or diarrhœa, in the advanced stages. In some cases of *gastralgia*, the pain is relieved, at least for a time, by eating food in considerable quantity, and the digestion is complete, or even too quick. In most cases of gastralgia, however, the presence of food in the stomach renews the pain; but not till some time after eating; generally, one, two, or even three hours; at which time, the patient experiences weight and mallaise at the epigastrium, as if a foreign body were lodged in the stomach. There are nausea, borborygmi, flatulent colic, eructations of air, but without fetor or causticity. Sometimes indeed, patients will taste the aliments that they have swallowed in the air which they eructate, but the digestion is completed, and diarrhœa is very rare. Constipation is generally obstinate, and the urine, especially when the

* Revue Medicale, November and December, 1825.

gastralgia is in a high degree, is usually pale, voided frequently, and in small quantities at a time.

5. Chronic gastritis never fails to impair the process of nutrition, inducing hectic fever, characterized by hardness and frequency of the pulse, heat of the skin, and evening exacerbations, with loss of flesh and strength, sallowness of the countenance, with a peculiar dark tinge, and finally, death.

6. In some violent and prolonged cases of *gastralgia*, the patient experiences difficulty of breathing, palpitations of the heart, wandering pains, and peculiar sensations of coldness, especially in the arms, loins, and lower extremities. The sleep is sometimes good, sometimes agitated, sometimes null; yet, in the mornings, the patient gets up refreshed, and feels quite well, till breakfast renews the gastric sensibility. Nothing of this kind obtains in latent *gastritis*.

7. Those who are affected with chronic inflammation of the digestive tube, are melancholy, morose, and impatient; but this is nothing to the state of moral depression and anxiety which obtains in *gastralgia*. In this last, there is ineffable despondency; disgust of life, or fear of death in the extreme; the slightest sensation in the stomach awakens the patient's terrors; he is tremblingly alive to every look of his physician—to every word which is spoken by his friends respecting his complaint; he is afraid of taking any thing into his stomach, as he knows, by doing so, he will aggravate the complaint; he is convinced that his disease is mortal—becomes entirely absorbed by his own sensations, and indifferent to every thing else. But any diminution or cessation of the gastralgia immediately changes the scene from despair to sanguine hope,—to be again reversed on the slightest accession of pain."

Dr. Armstrong observes, that the effects of a diffusible stimulus—such as wine, brandy, &c. will generally remove all doubts as to the presence of the one or the other of these affections. In *gastritis*, the pain and uneasiness in the stomach are always increased by potations of this kind; whereas, in gastralgia, relief is generally the result.* Whenever fever, pain, and anorexia occur after the operation of an emetic, we can no longer doubt of the existence of chronic gastritis. (Broussais.)

Post mortem appearances.—The organic changes effected in the stomach by chronic inflammation of its villous coat, are very various. In almost all fatal cases, more or less ulceration is found in the stomach; and these ulcers exist in various forms and stages of progress. Sometimes a single ulcer, not above a quarter of an inch, occurs, the other portions of the mucous membrane being

* The Morbid Anatomy of the Bowels, Liver, and Stomach. Fasciculus, i. and ii. London, 1828.

in a healthy condition. Occasionally, we find various ulcers—some partly cicatrized, others just beginning, and others again, deep with loss of substance, and rounded and elevated edges. When the ulcerated surface is large, there is "generally thickening and induration of the coats and fungoid elevations." (Abercrombie.) Sometimes the only organic lesion consists in a thickening of the mucous membrane, in different parts of its extent, of a pale ash, or brown, or a dark colour resembling melanosis. In other instances, portions of the mucous membrane are softened or broken down, or entirely destroyed.* Cases occur, however, in which no organic changes whatever are detected in the mucous membrane on dissection. In instances of this kind, the subjacent cellular tissue, says Andral, is found in a diseased state—and this is particularly observable in that condensed and whitish membrane between the villous and muscular tunics of the organ. (Med. Chir. Rev.) Andral observes, that thickening and induration of the mucous membrane, is one of the most certain marks by which *chronic* may be distinguished from *acute* gastritis. Softening of this membrane, is, however, the most frequent of all the organic changes effected in this disease.† In some unequivocal cases of chronic gastritis, M. Andral found nothing but stripes of thickened and condensed mucous membrane, and of a *paler colour than natural.* In one very strongly marked case, nothing but a patch of a milky white colour, with slight thickening and induration of the mucous membrane, was discovered on the stomach on dissection.

Treatment.—In the treatment of this variety of gastric inflammation, almost every thing depends on proper dietetic regulations. It is obvious, that every thing which tends to irritate the stomach, must be particularly calculated to favour the progress of the disease, and to aggravate the sufferings of the patient. It is, therefore, of the utmost importance in the remediate management of this affection, to allow nothing in the way of nutriment, but the blandest and least irritating articles of diet that can be contrived. Mucilaginous liquids, such as decoctions of barley, rice, thin gruels, and fluid preparations of arrow-root, tapioca, or sago, or boiled milk, and animal jellies, constitute the appropriate nourishment for patients affected with this disease. All solid articles of diet should be especially avoided.

Leeching or cupping over the region of the stomach is another of our most efficient means for subduing this distressing affection. Much benefit will also sometimes accrue from the application of a blister to the epigastrium; or, what has appeared to me still

* Pathological and Practical Researches on Diseases of the Stomach, &c. By John Abercrombie.

† Memoir sur les Charactères Anatomiques de la Gastrite Chronique. Par M. Andral, Repertoire Generale, Nos. 1 and 2, 1824.—*See Med. Chir. Rev. Jan.* 1827.

more useful, frictions with tartar emetic ointment, until pustulation is produced. Leeching and blistering should be used, from time to time, in alternation.

There is but little of permanent benefit to be derived from internal remedies in this complaint: if we except the occasional good effects of small doses of a weak emulsion of the balsam copaiva, an article which I have used in a few well-marked cases of this disease with considerable benefit.

℞. Bals. copaiv. ʒiss.
P. g. arab. ʒii.
Syrup limonis, ℥ss.
Aq. fontanæ ℥viii.
Tinct. opii. acetat. gtt. 30. M.
S. A small table-spoonful twice daily.

To palliate the distressing sensations in the stomach, as well as the general irritability both of mind and body, two or three grains of Dover's powder may be given at night on going to bed. For this purpose I have employed the lupuline with much benefit. From four to six grains of this preparation may be given once daily. The syrup of poppies may also be advantageously used, as an occasional anodyne in this affection. Care must be taken to procure regular alvine evacuations. This, however, cannot be prudently effected by laxatives taken into the stomach; for however mild they may be, they will almost inevitably do mischief by irritating the morbid mucous membrane of the stomach. One or two purgative enemata, *administered at stated hours* daily, rarely fail to procure all that may be desired in this respect.

Sect. VI.—*Of Acute Enteritis.*

Acute inflammation of the intestinal canal occurs under two forms, sufficiently distinct in their pathological characters and phenomena, to require separate consideration. In one of these varieties, the inflammation is seated chiefly, perhaps in some instances exclusively, in the *peritoneal* and *muscular* coats of the intestines; and in the other, the inflammation is confined wholly, or in a great measure, to the internal or mucous membrane. In the first, *constipation* is almost universally present; in the second, mucous discharges, with more or less blood and tenesmus, are rarely absent.

1. *Acute Peritoneal Enteritis.*

Symptoms.—This disease often commences with a feeling of uneasiness in some part of the abdomen, terminating, after a longer or shorter period, in a fixed aching or burning pain, referred

usually to the umbilical region. In some instances, the pain is confined to a circumscribed part; but it more frequently becomes diffused throughout the whole abdomen. *Obstinate constipation almost invariably exists*—except the inflammation extends to the mucous membrane of the colon or rectum, which, however, occurs but very rarely, when dysenteric discharges, with tenesmus and tormina attend. Nausea and vomiting are frequent and very distressing attendants on the disease;—the latter often becoming so constant and violent as to communicate the inverted action of the stomach to the bowels, causing stercoraceous matter to be thrown up. The tongue is dry, and generally covered with a white fur, sometimes of a pale red around the edges, with a streak of brown fur along the middle; the thirst is urgent; the urine scanty, high-coloured, and frequently discharged with considerable difficulty; the skin hot and dry on the trunk of the body, but often moist on the forehead and in the palms of the hands; the pulse small, frequent, and tense; and the respiration almost always more or less disturbed—being usually short, anxious, and performed by the action of the intercostal muscles exclusively. To avoid pain from the pressure of the abdominal muscles on the inflamed bowels, the patient lies on his back, with the knees drawn up, and the shoulders raised by pillows, by which the tension of these muscles is diminished. Sometimes acute peritoneal enteritis is ushered in "by a sort of rigor," exhibiting, in its subsequent course, two distinct stages—one of excitement, and the other of collapse, resembling, in this respect, acute peritonitis. In the stage of collapse, the extremities become cold, and at last damp, "while the fingers and hands are generally mottled by a dun sort of redness here and there." The pulse becomes weaker and weaker, until it feels under the finger "like a soft undulating line." Great prostration of the muscles exists; the "face becomes death like; the abdomen tumid and tense;" and, lastly, a sort of passive gulping generally takes place, the contents of the stomach being apparently forced up the œsophagus by the pressure of the intestines, which are then, for the most part, enormously distended with flatus.*

Peritoneal enteritis is generally rapid in its course, and is peculiarly prone to terminate in gangrene. When this termination is about taking place, the pain suddenly subsides; the pulse sinks rapidly; the countenance becomes pale and cadaverous; the extremities cold; the surface covered with a cold clammy sweat, and hiccough, slight delirium, and occasionally convulsions, close the scene. This affection is seldom protracted beyond the seventh or eighth day, without terminating either in resolution or in death.

* Armstrong's Morbid Anatomy of the Bowels, Liver, and Stomach, &c.

Diagnosis.—When the inflammation is seated in the arch of the colon, peritoneal enteritis may stimulate pleuritis or hepatitis. From these affections it may be distinguished by the following circumstances:—In pleurisy, the pulse is *full*, hard, and active—in enteritis, it is contracted, corded, quick, tense, and frequent. In pleurisy, the respiratory motion of the thorax is not conspicuous, the act of respiration being performed wholly by the diaphragm and the abdominal muscles—in enteritis, on the contrary, the chest is regularly and strongly dilated and contracted by the action of the intercostal muscles, whilst the abdominal muscles and the diaphragm are quiescent. In pleurisy, the pain is aggravated by pressure on the intercostal spaces, but abdominal pressure causes little or no suffering—in enteritis, the reverse obtains, abdominal pressure causing much aggravation of the pain, whilst pressure on the intercostal spaces gives no particular uneasiness.

"From simple peritonitis, enteritis differs by the presence of vomiting, and obstinate constipation of the bowels. The pulse also is more permanently frequent, and the pain more violent and constant, often resembling the tormina of ileus."*

From spasmodic pain of the bowels, enteritis is readily distinguished by the following signs:—In enteritis, the patient lies quiet on his back, moving himself as little as possible—in colic, he throws himself about almost continually. In enteritis, abdominal pressure aggravates the pain—in colic it often relieves it. In the former affection the pain is continuous—in the latter, it frequently intermits entirely for a short period. The skin, in enteritis, is hot and dry—in colic, it is seldom above the natural temperature, and generally moist. In colic there is rarely any thirst—in enteritis almost always.

It has already been stated that in the present variety of enteric inflammation, the chief, and sometimes perhaps the exclusive seat of the disease, is in the external peritoneal covering of the intestinal canal, though the muscular coat, no doubt, very generally participates in the inflammation. In some cases, it would seem, the inflammation commences in the internal or mucous membrane, and after a longer or shorter period, leaves this structure to fix itself on the muscular and peritoneal tunics. (Armstrong.)

The existence of obstinate constipation in enteric inflammation may be regarded as a pretty certain sign that the disease is seated in the peritoneal and muscular coats of the bowels, or in one or the other of these tunics separately. Abercrombie† asserts, that in *peritoneal* enteritis, the peristaltic action of the bowels is not

* Abercrombie on the Diseases of the Stomach, &c.

† Pathological and Practical Researches on the Diseases of the Intestinal Canal. Edinburgh, 1828.

particularly affected; and that, whenever obstinate resistance to the operation of purgatives exists, the *muscular* coat is the seat of the inflammation. This does not entirely accord with general experience; for, it is well known, that constipation is scarcely ever absent in every variety of peritoneal inflammation. Without doubt, inflammation of the *muscular* coat will always be accompanied with more or less inactivity of the bowels; but the mere absence or presence of constipation, cannot be viewed as distinctive of muscular and peritoneal inflammation in enteritis. It is, indeed, probable that peritoneal and muscular inflammation are almost always concomitant in this affection; and all attempts to assign appropriate symptoms to each separately, must be fallacious, and, indeed, of no practical usefulness whatever. Nevertheless, the presence of costiveness or diarrhœa affords us a good diagnostic between *mucous* and peritoneal, or peritoneo-muscular inflammation in enteritis. "In proportion as the force of the inflammation is directed upon the peritoneal and muscular coats of the intestines, *constipation* prevails; and, on the contrary, when irritation or inflammation is seated in the mucous membrane, diarrhœa or dysentery obtains." (Dr. James Johnson.)

Post mortem appearances.—The only favourable termination of peritoneal enteritis is in resolution—and this termination is frequently attended by a moderate diarrhœa. Suppuration is a rare occurrence in this affection. I have lately, however, met with an instance in which this termination occurred. Its most common fatal termination is in gangrene. But it would seem from the observations of pathologists, that this disease sometimes terminates fatally, without the occurrence either of suppuration, effusion, or gangrene, or without any perceptible structural changes, (Wilson, Broussais, Abercrombie,) and merely "from the general irritation and lesion of function."

In some cases of extensive inflammation of the external tunic of the bowels, coagulable lymph is thrown out, and adhesions formed between the different folds of the intestinal tube, so as to agglutinate the bowels in some instances, into a round and firmly adherent mass. This mode of termination is usually accompanied by more or less of a sero-purulent fluid in the cavity of the abdomen, attended sometimes with masses of a fatty substance resembling soft butter, deposited in the cavities formed by the folds of the intestines—an instance of which occurred not long since to Dr. Hartshorn and myself.

Causes.—Peritoneal enteritis may be produced by an accumulation of indurated feces in the bowels; by spasm; external mechanical injuries; hernia; drastic purgatives; sudden suppression of perspiration from cold; standing long on cold and damp ground; metastasis of external inflammations,—of gout, rheumatism, erysipelas, &c.; intus-susception, worms, wounds, &c.

Prognosis.—This disease is always to be regarded as one of very considerable danger. A very contracted or scarcely perceptible pulse, attended with cold hands and feet; or an extensive diffusion of the pain throughout the abdomen, more especially when, at the same time, the abdomen becomes tumid, tense, elastic, and extremely tender to pressure, indicates great danger. Very frequent and violent vomiting is also a very unfavourable sign; for, independent of the additional irritation and suffering which it causes in the inflamed structures, it contributes in no small degree, to increase the general prostration, and prevents, moreover, the retention of both remediate and nutrient articles into the stomach. Hiccough, in the early period of the disease, is not indicative of particular imminent danger; in the advanced stage it comes in the train of fatal symptoms, manifesting the supervention of gangrene. An expanded state of the pulse may be regarded as a favourable sign—the degree of violence and danger corresponding generally with the degree of contraction and obscurity of the pulse. After all, the prognosis in this affection is always attended with much uncertainty. I have seen patients recover from this disease after most of the above unfavourable symptoms had made their appearance; and, on the contrary, several deaths have occurred from this affection, in my practice, most unexpectedly, when no particular unfavourable symptoms were present.

Treatment.—In the commencement of the disease, prompt and efficient blood-letting is the remedy upon which our hopes of success must be mainly placed. The first bleeding should be carried to the extent of producing a decisive impression on the system. After the violence of the disease has been thus checked, smaller bleedings should be repeated from time to time, so as to keep up the impression made by the first. The success of medical treatment in this affection depends in a great measure on promptly breaking down the violence of the inflammation during the first twenty-four hours, and nothing can contribute so much to this desirable effect, at this early period of the complaint, as efficient blood-letting.

Writers have expressed different opinions with regard to the utility of local bleeding by leeches, in this, as well as in other acute inflammations within the cavity of the abdomen. Abercrombie observes, that "leeches are entitled to no confidence, except when the affection is limited, or the strength unable to support constitutional measures." In the beginning of the disease, little or no advantage will result from this mode of depletion, but after the violence of the inflammation has been subdued by decisive venesection, leeching over the seat of the pain is unquestionably a very important auxiliary. The removal of blood in this way must at least tend to sustain the antiphlogistic

impression made by the previous general bleeding, and it may be practised with advantage where the propriety of further venesection may be doubtful.

Purgatives, under proper management, are decidedly useful in this affection. The more *drastic* articles of this kind, however, should be avoided, as they rarely procure adequate evacuations, and frequently do mischief by exciting much sickness, vomiting, and tormina. In two instances of this disease reported by Dr. Abercrombie, a relapse was the consequence of the use of drastic purgatives. He thinks himself warranted, from the results of his experience, to conclude that purgatives are apt to prove detrimental in the early period of enteritis, and in this opinion Dr. Johnson seems inclined to agree with him. In the early stage of the disease, laxative enemata ought to be used; and I have known considerable advantage derived from the copious injection of warm water, rendered slightly mucilaginous by starch or flaxseed, into the bowels. *Laxatives* of the milder kind, when judiciously managed, are, however, not only perfectly harmless, but generally unequivocally beneficial in this malady. But even these should not be administered until a strong impression is made on the system by blood-letting. After proper depletion has been made, the intestines ought undoubtedly to be evacuated by the administration of laxatives; and for this purpose calomel, with castor oil and *opium*, will generally answer perfectly well. Two grains of opium, with five or six grains of calomel, may be given every two hours. As soon as the abdominal pain is allayed, and the skin becomes soft, effects which almost invariably follow the use of this anodyne, an ounce of castor oil should be given, and repeated in half ounce doses every two hours, until the bowels are freely evacuated. Should this plan fail to excite purging, enemata must be given to promote the operation of the oil. One of the best injections for this purpose is spirits of turpentine, mixed with some mucilaginous fluid. Thus:

℞. Ol. terebinth. ℥j.
Vitelli ovi. No. ii.
Infus. sem. lin. tepid ℥xvi. M. ft. enema.

When this is effected, another full dose of opium must be administered, and quietude enjoined. It is to be recollected, however, that the use of this valuable narcotic is to be restricted altogether to the advanced period of the disease, when the general and local inflammatory excitement has been in some degree broken down by sanguineous evacuations; for at an earlier period it could hardly fail proving injurious.

Nothing need be apprehended from the ordinary constipating effects of opium in this disease. This article, on the contrary, is in general, the best means we possess for favouring the opera-

tion of purgatives in enteritis. It lessens the extreme irritability and sensibility of the inflamed intestines, and thereby prevents purgatives and the usual contents of the bowels from exciting them into inordinate contraction, the principal cause perhaps of the constipation. Drs. Armstrong and Johnson have done much towards removing the prejudices so generally entertained against the employment of opium in some of the phlegmasial affections. The former of these eminent writers states, "that his attention was drawn to this subject by observing a chasm or defect in the common modes of treating acute abdominal inflammation by the simple depletion of bleeding and purging. He had long observed, that when in affections of this kind opium was given in full doses, immediately after copious depletion, the cases terminated successfully. Within the last four years I have prescribed large doses of opium, after adequate blood-letting, in at least a hundred cases of acute and subacute inflammation in the abdomen, and always with obvious advantage." In acute peritoneal inflammation of the stomach and bowels, he makes it a rule to bleed in the first stage, until syncope approaches. As soon as the patient recovers from the faintness caused by the first bleeding, three grains of opium are administered and quietude enjoined. "The effects of opium thus administered are to prevent a subsequent increase in the force and frequency of the pulse, and a return of abdominal pain, while it induces a tendency to quiet sleep, and a copious perspiration over the whole surface. If in three or four hours after the opium is taken, there is pain on pressure in any part of the abdomen, with a hot and dry skin, and a quick jerking pulse, I order the patient to be immediately bled in the same decisive manner."* Dr. Johnson,† in remarking on a fatal case of enteritis observes: "medical men now-a-days trust too exclusively to sanguineous evacuations in enteritis, and neglect certain and powerful auxiliaries which they would do well to call to their aid. If, when they have bled copiously, and as far as the patient's strength will

* Transactions of the Associated Apothecaries, and Surgeons Apothecaries, of England and Wales, vol. i. article 3.

† In his remarks on Dr. Scott's case of fatal cystitis hepatica, (Edin. Journ. April, 1825,) Dr. Johnson uses the following language, in relation to the employment of opium in inflammatory affections. "We reiterate what we have often said before, that practitioners are too much afraid of opium in inflammations, especially of the abdominal viscera. Yet, after copious bleeding, there is not the smallest danger in its administration, especially if combined with calomel. But practitioners seem, in general, to have but one idea in inflammation—depletion—depletion. All other considerations are absorbed in this. The pain, and its consequences on other organs and systems, go for nothing. Bleeding and purging are the catholicons. The *quantity* of opium should never be considered in such cases, but only the *effect*. It must be given so as to subdue pain and irritation, whatever may be the magnitude of the dose."—*Med. Chir. Rev. July*, 1825, p. 223.

bear, they will exhibit opium in combination with calomel, they will have the satisfaction of saving many lives. This has been my practice, and I know it to be the successful practice of one of the first hospitals of London." Schmidtmann, one of the most experienced of the German physicians of the present day, observes, that *opium* deserves to be considered as among the most powerful anti-enteric remedies. He particularly recommends the exhibition of this narcotic, in union with calomel, and asserts that since he became acquainted with the valuable powers of this combination, he has not found it necessary to draw so much blood as before.* In my own practice I have had repeated and decisive evidence of the usefulness of opium, not only in the present, but in many other of the phlegmasial affections. When given in diseases of this kind, it ought always to be used in large doses—from two to four grains after suitable evacuations, so as to allay the pain, and with it the general sympathetic irritations of the system.

Blisters applied to the abdomen, after the local and general inflammatory action has been in a measure subdued by venesection, are powerful auxiliaries in the treatment of enteritis. Fomentations, also, or large emollient poultices applied on the abdomen, will occasionally procure considerable advantage in this affection. Some writers strongly recommend *tobacco* injections in enteritis—(Abercrombie;) and they certainly tend in no small degree to diminish the momentum of the circulation, and to excite alvine evacuations, effects which are especially desirable in this affection. From the great aptitude of tobacco to produce extreme relaxation and prostration, as well as sickness of the stomach, great caution is necessary in the employment of this article, lest sudden and alarming depression be induced. An injection of this strength may be used without apprehension of mischief from its depressing influence:†

* Dr. S. expresses himself in the following manner, in relation to the use of opium in this affection:

"Ex quo hoc (connubium calomelis et opii) in usum verto in curanda enteritide non tot mihi opus est phlebotomis, quam olim, cum potens hoc remedium ignorarem.

"Vix enteritidis curationem adgressurus essem sine opio. Et mihi videtur, idem, præmissis præmittendis, inter potentissima antienterica numerandum esse. Notum enim est, inflammationem irritatione, procreari, atque fibras viventes extimulatas majoram exserere conatum oscillandi et se movendi: ex quo sequitur, in enteritide motum peristalticum augeri et accelerari; quod vomitus sæpe enormis, ut plurimum cum ea conjunctum est, inflammationem actione et motu fibrarum partis adfectæ exasperari, eandem autem quiete et vacatione a motu deliniri et compesci. Cum jam opio motus intestinorum vermicularis retardetur et imminuatur; ideo in enteritide ab eo princeps auxilium expectandum est: quocum experientia pulchre conspirat."—*Summa Observationum Medicarum. Auctore I. J. Schmidtmann.* Berlin, 1821, vol. ii. p. 110.

† This remedy is recommended by Selle.—Vide *Medicina Clinica*, p. 89. Berolini, 1785.

℞. Infus. tabaci. ℥ij.
Aquæ ferventis ℥xvi. M. The half of this will be sufficient for one enema.

The ordinary internal antiphlogistic remedies, such as nitre, antimony, spiritus mindereri, &c., are not only useless, but almost always decidedly injurious. *Digitalis* may be used with advantage in the advanced periods of the disease, when the inflammation has nearly subsided, and the pulse still remains in an irritated condition—namely, quick, frequent, and sharp. The best way of giving this article is in the form of powder, of which from a quarter to half a grain may be given every hour or two, until its influence on the action of the heart is manifested in the reduction of the pulse.

When the symptoms which are known to announce and accompany the occurrence of gangrene supervene, we should not immediately abandon all hopes of the patient's recovery, or cease our efforts to save him. In instances of this kind the exhibition of stimuli will occasionally speedily remove every dangerous symptom. I attended a man during the present year, affected with acute enteritis; on the sixth day of the disease the pain ceased, his pulse became extremely small and weak, and the hands and feet of an icy coldness, and damp, with great muscular prostration. I supposed gangrene had taken place—announced to the patient's friends his speedy and inevitable dissolution, and directed all remediate efforts to be discontinued, with the exception of the use of wine and water as freely as he might desire to take it. Instead of finding him dead, as I expected, on the following morning, he was so much better as to leave very little doubt of his final recovery, an event which was happily realized. Abercrombie has recorded a case of this disease, in which the importance of attending to this fact was strikingly illustrated.*

Mild and mucilaginous diluents may be freely allowed, unless they distress the stomach, or excite sickness.

During the period of convalescence, the patient should abstain entirely from every kind of stimulating or indigestible food. Nothing but the mildest and least irritating articles of diet should be used for several weeks after recovery. The slightest error committed in this way is apt to renew the intestinal inflammation.

After an attack of enteritis, the intestines are particularly liable to become much distended with flatus, giving rise to troublesome tympanitic distention of the abdomen. This state of the bowels may, in general, be corrected by external abdominal frictions, particularly with the flesh-brush, and by injections of

* On Diseases of the Stomach, &c. p. 176.

infusion of mint, with assafœtida, or turpentine. Schmidtmann recommends a decoction of the iceland moss with colomba root, and the extract of nux-vomica, as peculiarly useful to allay the morbid sensibility of the bowels, after the inflammation has been removed.

2. *Acute Mucous Enteritis.*

Acute inflammation of the mucous membrane of the intestinal canal, may attack either the whole of this structure, from the stomach to the termination of the rectum, or only a part of it; and the symptoms by which it is manifested, are considerably diversified, according as its superior, middle, or inferior portions, are chiefly or exclusively affected.

When the inflammation is seated in the *duodenum*, the tongue is generally covered with a whitish fur; the taste is bitter; the appetite greatly diminished or entirely lost; *the whole surface of the body is apt to become jaundiced;** the urine is high-coloured and bilious; there is headach; and on the external region of the duodenum, a shining fulness or puffiness may generally be perceived. The pain is not often considerable, and the bowels, though slow, may be readily moved by mild laxatives or enemata. More or less nausea and vomiting, usually occurs; and the pulse is corded, though commonly fuller than in gastritis. (Broussais.)

When the inflammation is confined to the *small intestines*, the tongue is coated with a white or light brown fur along the middle, with its edges and tip of a bright red colour; the bowels are sometimes loose, or are readily moved, the stools being of a mucous, or oleaginous character; and the "integuments of the abdomen, hard and tender under pressure at particular points or patches." The stomach is generally irritable; and a continued slight burning pain, with a sensation of weight, is felt in the umbilical region, with occasional tormina.

When the inflammation is located *chiefly* in the mucous membrane of the colon and rectum, the disease is characterized by frequent mucous and bloody stools, tormina, tenesmus, and retention of the natural feces, constituting

Dysentery.

Symptoms.—This disease is often ushered in by a sense of lassitude, want of appetite, nausea, bad taste in the mouth, de-

* Dr. James Johnson, in remarking on a case reported by Andral, jun. observes: "A curious fact has in these days of diligent investigation been pretty fairly established, namely, that irritation or inflammation in the mucous membrane of the duodenum, will sometimes produce jaundice, where no obstruction can be detected in the biliary duct. This fact, we think, will ultimately throw some light on the nature of yellow fever."—*Med. Chir. Rev. Jan.* 1828.

pressed pulse, slight chills alternating with flushes of heat, thirst, dry skin, transient pains in the bowels, costiveness, and occasionally diarrhœa. Sometimes the disease comes on suddenly with griping, mucous and bloody stools and tenesmus, without any premonitory symptoms; and this is most apt to be the case, when it arises from causes that act immediately on the mucous membrane of the intestines. In general, the fever is developed before the proper dysenteric symptoms show themselves; sometimes more or less diarrhœa, with tormina, precede the occurrence of febrile irritation; and occasionally mucous and bloody stools with tenesmus, are the first symptoms. From the commencement of the disease, throughout its whole course, little or no feces are discharged spontaneously,—the stools consisting entirely of intestinal mucus, mixed with more or less blood. Tenesmus is one of the most constant and characteristic attendants on this affection; and the violence of this painful symptom affords us a pretty accurate measure of the violence and degree of danger of the disease. There is often considerable pain and difficulty experienced in voiding urine. The tormina are extremely violent and distressing, particularly just before the urgent calls to stool are experienced; and a constant soreness is felt in the abdomen. Sometimes the stools consist almost entirely of intestinal mucus, very little or no blood being mixed up with it. In most instances, however, a considerable portion of blood is discharged with the mucus, and in some cases the evacuations consist almost wholly of blood. These dysenteric discharges usually have a very peculiar disagreeable smell, but no fetor in the beginning of the disease; but in the advanced period of violent and dangerous cases, they frequently possess a pungent and cadaverous smell; and often acquire a corroding and sanious character. Sometimes a colliquative diarrhœa occurs, a few days previous to the fatal termination of the disease. In some instances, the heart and arteries sympathize but very little with the local mucous inflammation, the febrile phenomena being scarcely perceptible; but much more commonly, the attending fever is of a high grade. In protracted and unsubdued cases, great prostration ensues; the pulse becomes small, corded, and very frequent; the countenance contracted and cadaverous; the abdomen tender and elastic, and sometimes flat; the skin harsh and shrunk; the breath offensive, and the gums tender and swollen. An apparent amendment occasionally occurs after these dangerous symptoms have come on; but this truce generally lasts but a short time; for, although the pulse rises and becomes better, and the tenesmus and tormina remit, the restlessness and anxiety increase; the stools become liquid, dark, pungent, and offensive; the countenance hippocratic; the extremities cold; and the surface of the body moist and clammy. At

first, the tongue is covered with a white fur, becoming brown, rough, and dry along the middle in the progress of the disease, with red and moist edges. In cases of a protracted, or subacute character, the edges and tip of the tongue usually become clean, smooth, and florid; and in the chronic form of the disease, the whole surface is often smooth, clean, and red; or red and granulated like raw flesh. The urine is always scanty and high-coloured, and sometimes of a pungent odour.* The *hepatic* and *cutaneous* functions are always inactive in this affection, the alvine discharges being invariably free from bile, and the skin obstinately dry during the active period of the malady.

Causes.—Obstructed perspiration from cold, or vicissitude of atmospheric temperature, is a frequent cause of mucous inflammation of the intestinal canal. A cold and moist autumn succeeding a warm and dry summer, is peculiarly favourable to the production of dysentery. *Koino miasmata* have frequently an unequivocal agency in the production of this disease. It is doubtful, however, whether paludal exhalations are of themselves capable of exciting this affection; but their influence in modifying its general character, is frequently very evident in hot and marshy countries, where the disease generally exhibits a mixed character, partaking both of the nature of bilious remitting fever and of pure dysentery. In localities of this kind, it is not uncommon to find intermitting fever and dysenteric symptoms succeed each other in alternation—several instances of which I have myself observed. Dysentery seems, indeed, very often the production of the united influence of koino miasmata and atmospheric vicissitudes; and hence, perhaps, the almost universal presence of torpor of the hepatic and cutaneous functions in this disease.† The atmospheric temperature which is necessary to the production of miasmata, is sufficient also to excite the cutaneous exhalents to inordinate action; whilst both the heat and the miasmata tend, at the same time, to increase the biliary secretion. If in this state of predisposition, a sudden reduction in the temperature of the air occurs; or if the body be exposed to the chilling effects of a humid and cool night air, the exha-

* Dr. Ferguson, in his account of the dysentery which prevailed during the British campaigns in Portugal and Spain, states, "that in the aggravated form of the disease, there appeared one never-failing symptom, which served him as a guide and diagnostic. The urine was high-coloured, even green, scanty, and pungent;" and these phenomena he regarded as the signal for the vigorous employment of mercury."—*Med. Chir. Trans.* vol. ii.

† "In every case of dysentery," says Dr. Johnson, "that has ever come within the range of my observation, two functions were invariably disordered from the very onset, and soon drew other derangements in their train. These were the functions of the skin and the liver; or perspiration and biliary secretion. I defy any one, who has attentively regarded this disease at the bed-side, to produce a single instance, in which these functions were carried on in a natural manner, at any period of the disease."—*On the Influence of Tropical Climates*, vol. ii.

lents of the surface will be rendered torpid, the blood recoil from the external to the internal vessels, and the liver, in common with the other internal organs, becoming engorged with blood, will not only become further disturbed in its functions, but contribute directly to congestion in the portal vessels, and consequently to the rise of intestinal inflammation.

There is a form of dysentery, called by some scorbutic dysentery, which appears to be the product of *idio miasmata*, and atmospheric vicissitudes, or cold and humidity operating conjointly. Of this kind, was the very peculiar and fatal dysentery which prevailed a few years ago at the Milbank penitentiary in England.* In this epidemic, spots or specks of a blue or livid colour appeared about the hams and sometimes over the whole surface of the inferior extremities, and occasionally also on other parts of the body. The gums were spongy, soft, livid, and much disposed to bleed; and in some, the gums ulcerated, the teeth became loose, and the mucous membrane of the lips and mouth black, while the breath was extremely offensive. Some of the patients passed pure blood from the bowels; others, a fluid like the washings of flesh; sometimes the stools consisted wholly of mucus and slime, streaked occasionally with blood; and in some instances, "they contained what seemed to be lumps of flesh." Nearly all complained of a distressing and very peculiar feeling of "sinking," at the pit of the stomach. This disease was ascribed by the committee appointed to investigate its cause, to the constant and exclusive use of vegetable and farinaceous diet acting in conjunction with atmospheric inclemency. I think there are good grounds for believing, that in addition to these causes, an atmosphere inquinated with the effluvia generated in crowded apartments, had no inconsiderable share in the production of this very peculiar affection.

Although cold and dampness suddenly succeeding warm weather, may be regarded as a very common exciting cause of this disease, yet as great and sudden atmospheric changes frequently occur without the production of dysentery, the disease appearing extensively during some years, whilst in others it does not occur although equally variable and inclement, it would seem probable, that *cold*, or sudden variations of atmospheric temperature and humidity, must operate in conjunction with other general causes of an occult character, before the disease can become extensively prevalent.

Among the sporadic causes of dysentery, may be mentioned the immoderate use of unripe fruit; indigestible and unwholesome food; and irritating articles of all kinds received into, or

* An Account of the Disease lately prevalent at the General Penitentiary. By P. M. Latham, M. D. London, 1825.

generated in the bowels. Most writers mention *scyballa* as a frequent cause of this affection; but the correctness of this opinion has of late been, with much justice, controverted. (J. Johnson.) Out of the very considerable number of cases of this disease which have come under my own observation, I do not remember more than six or seven in which scyballa were discharged. Dr. Cullen could certainly not have spoken from observation, when he declared that, "it is *certain*, that hardened feces, retained in the colon, are the cause of the griping, frequent stools, and tenesmus."

Post mortem appearances.—The true pathological character of dysentery was not well understood, until within the last twenty years. Richter was of opinion that dysentery is a rheumatic or catarrhal affection of the intestinal tube. This opinion was, indeed, formerly entertained by many pathologists; it was advocated by Akenside, Stoll, and Vogler. Recamier, (Rev. Medicale, Jan. 1825,) alleges that the cause of dysentery consists in "a vitiated state of the fluids which stagnate in the alimentary canal;" *i. e.* the bile or the intestinal mucus, and the pancreatic juice. Inflammation of the mucous membrane, he says, is not primary in this affection; but secondary, the result of the irritating action of these fluids on the internal membrane of the intestines. Dr. Cullen considered the proximate cause of the disease to be "a preternatural constriction of the colon, occasioning those spasmodic efforts which are felt in severe gripings, and which efforts, propagated downwards to the rectum, occasion the frequent mucous stools and tenesmus." It does not appear that he suspected the existence of mucous inflammation as the essential pathological condition of this affection. Later inquiries have shown, however, that an inflamed state of the mucous membrane of the large intestines is invariably present to a greater or less extent in the disease.* In some instances, inflammation and its consequences are found no where but in the colon and rectum, but frequently more or less phlogosis occupies the whole extent of the intestinal tract, from the duodenum to the rectum. But even where this is the case, the signs of inflammation and its effects are always most conspicuous in the *large intestines*. When dysentery terminates fatally in the early or inflammatory stage, the mucous membrane of the colon and rectum presents numerous red patches, somewhat elevated above the level of the surrounding parts; and in some cases these elevated portions are

* This, indeed, is contradicted by Recamier. He states, "when death takes place early and suddenly in dysentery, whether from the disease itself, or the supervention of another malady, we find no trace of inflammation in the intestinal canal, but only acrid fluids, which are sometimes so irritating as to cause erysipelas in the parts with which they come in contact."—*Revue Medicale, Jan.* 1825, p. 23.

covered with a number of minute vesicles—more especially "in the disease as it appears in infants."* Dr. Cheyne, in his account of dissections made at the Whiteworth Hospital, Dublin, says: "the mucous membrane of the stomach and small intestines *sometimes* presented an inflamed appearance, which in general became more remarkable as the great intestines were approached." In the colon ulceration began to show itself; in the part nearest the small intestines these ulcerations were superficial; but as the bowel was traced downwards they became deeper and more extensive. It was remarked that the last three or four inches of the rectum was sometimes almost entirely free from ulcerations. In the cases where death took place in the early stage of the disease, from the mere violence of the fever, or from some other affection, the mucous membrane of the stomach and intestines was found more or less of a deep red or purple colour, soft and pulpy, with an uneven surface not unfrequently rough and granulated.† In some instances considerable structural derangement of the liver occurs in the affection. Dr. Preston, in his account of the dysentery which appeared in the seventy-ninth regiment at Limerick, in the year 1821, states, that "the liver was invariably deeply engaged in the disease; it was in general considerably enlarged, and its whole structure apparently destroyed." That the liver is always functionally disordered in this complaint, has already been stated. In sporadic cases, however, organic derangement of this viscus is very rarely noticed, whilst in epidemic dysentery, particularly as it occurs in hot and insalubrious climates, this very frequently occurs.

Prognosis.—When the discharges in the commencement consist almost entirely of blood, the disease is usually much more tractable than where they are composed chiefly of mucus, or mucus streaked with blood. Copious discharges of blood in the beginning of the disease are beneficial, perhaps, by lessening the congestion in the portal vessels. Colliquative and fetid stools, in the advanced periods of the disease, are indicative of much danger. A tympanitic state of the bowels, more especially when attended with discharges of a "muco-sanious fluid," is a highly unfavourable sign. The appearance of bile and the natural feces in the stools, indicate a favourable change. When the tormina, tenesmus, and tenderness in the abdomen abate, at the same time that the skin becomes uniformly moist, we may regard the disease as tending towards convalescence; and the more certainly, if the stools assume more of a natural appearance.

Treatment.—There are four morbid conditions present in this

* Abercrombie, Pathological and Practical Researches on the Diseases of the Stomach, &c. p. 226.

† Medical Reports, &c. by J. Cheyne, M. D. Dublin Hospital Reports, vol. iii. p. 29.

disease, which point out the general indications to be pursued in its remediate management: namely, 1. inflammation of a greater or less extent of the mucous membrane of the intestinal canal; 2. general irritated vascular excitement; 3. torpor of the cutaneous exhalents; and, 4. disordered function of the liver. According to these pathological conditions, the principal indications are: 1. to moderate the febrile reaction of the heart and arteries, where it is excessive; 2. to restore the regular action of the liver and skin; and, 3. to subdue the local inflammation of the bowels. In estimating the relative importance and urgency of these indications, it is to be observed, that torpor of the cutaneous exhalents, and hepatic derangement, are generally antecedent to the intestinal inflammation, as well as to the febrile reaction. It would seem reasonable, therefore, to conclude, that the restoration of these functions in the early or commencing stage of the disease, constitutes a primary object in the treatment of this affection, and this is indeed confirmed by experience; for in proportion as we succeed in the accomplishment of this purpose, so do we equalize the circulation, lessen the determination of the blood to the bowels, and subdue at once the general febrile excitement, and the local intestinal affection.

As high arterial excitement is incompatible with the regular performance of these functions, and tends especially to augment and sustain the local intestinal inflammation, the first step in the treatment of the disease is to moderate the febrile excitement, where it is excessive, by blood-letting. In many instances, however, the attending fever is so moderate as not to call for direct depletion; and epidemics occur in which the fever is of a *typhoid* grade, and in which the abstraction of blood is wholly inadmissible. Whenever the pulse is firm and quick, or tense and frequent, blood should be drawn. Bleeding, however, is, upon the whole, a much less useful remedy in dysentery than in many of the other phlegmasial affections. Dr. O'Brien, in his account of the dysentery in Ireland in 1821, says, "that he very much doubts if bleeding has ever succeeded by itself; or if it be capable of succeeding in this disease, as it often does in other phlegmasial affections. Blood-letting ought to be considered only in the light of a useful auxiliary, and as applicable, principally, if not solely, to the early stage of the disease." This corresponds with the observations of Broussais; (Phleg. Chron. vol. ii. p. 20,) and my own experience has satisfied me of its correctness in reference to the dysenteries of temperate latitudes. In hot climates the disease is often very impetuous in its attack, and so highly inflammatory, that prompt and copious bleeding affords almost the only means for checking its violence, and preventing its rapid termination in disorganization of the liver and bowels. Dr. O'Halloran, in the dysentery which prevailed at Gibraltar

in 1824, a highly rapid and inflammatory epidemic, bled in the onset of the disease to the extent of from 30 to 64 ounces at once, so as always to induce faintness. Dr. Armstrong, too, is a strenuous advocate for decisive blood-letting in violent attacks of this disease. "Let bleeding," he says, "be once fairly introduced in the beginning of the *severer* modifications of dysentery, and there will be fewer fatal as well as chronic cases." Bleeding is, without doubt, a highly valuable remedy in the more inflammatory cases of this affection; but it is equally true, that in the ordinary instances of the disease, as it prevails in the temperate latitudes, it may very frequently be properly dispensed with. When the attending fever is of a high grade, one or two efficient bleedings in the beginning of the disease, will generally moderate the tormina and fixed abdominal pain, and favour the beneficial operation of purgatives, calomel, opium, and blistering; remedies upon which our principal reliance must be placed.

Purgatives, under judicious management, are among our most valuable curative means in this affection. The secretions deposited in the alimentary canal, appear to be highly acrid and irritating in dysentery, (Recamier) and cannot fail to increase the violence of the disease, and the sufferings of the patient, when suffered to remain in the bowels. They should, therefore, from time to time, be evacuated, by exhibiting the *milder* laxatives, throughout the whole course of the disease. Formerly it was commonly supposed that purgatives proved serviceable chiefly by dislodging and evacuating *scyballæ*, to the immediate irritation of which the disease was ascribed. The most active articles of this kind were accordingly employed, and repeated often to an injurious extent. I have already stated, that these hardened masses of feces are by no means very common, nor is it necessary to employ very active cathartics to remove them, when they do exist in the bowels. Dr. Johnson very correctly observes, that "the search after these imaginary matters in the bowels, or rather the anxiety to dislodge them, has led to a cruel and injurious system of purgation in dysentery." Our object in the employment of aperients in this disease, is simply to evacuate the contents of the bowels, and the less irritation that is produced in accomplishing this object, the more beneficial, we may presume, will be the result. *Castor oil* and *calomel* are among our most valuable laxatives in this painful affection. As soon as can be, after the commencement of the disease, from 10 to 12 grains of calomel should be administered; and followed, after the lapse of three or four hours, by an ounce of castor oil, to which 20 or 30 drops of laudanum may be advantageously added. The union of anodyne and laxative remedies is particularly beneficial in cases attended with much pain and soreness in the abdomen. In instances of this kind, the irritability of the bowels is often

so great, that even the mildest laxatives frequently occasion much griping and spasmodic contraction of the intestinal tube, in consequence of which, little or no feculent discharges are procured by their operation. Under these circumstances, opium, so far from impeding the operation of laxatives, contributes often considerably to their aperient effects, rendering the discharges feculent, copious, and less painful. Dr. Cheyne states, that castor oil did no good in the epidemic he describes, unless it was given in conjunction with laudanum, when it always answered remarkably well. Calomel should always form a part of our laxative remedies in this disease, particularly in its early stage. This article would appear to be peculiarly beneficial in the dysenteries of hot climates. Dr. Johnson (on Tropical Climates) gave it in scruple doses with the happiest effect, a practice which has been pursued in the southern districts of our own country with marked benefit. In the ordinary forms of the disease, as it occurs in the temperate, and less miasmatic latitudes, however, it will seldom be necessary to resort to doses of this size, although I should apprehend no particular disadvantage from one or two such doses in the early periods of the disease. Rhubarb was at one time much employed in this affection ; but its operation is always slow and uncertain in this disease, and generally attended with very severe griping. In chronic dysentery, however, rhubarb, from the tonic powers which it possesses, may be used occasionally with considerable advantage. Dr. Cheyne has known half an ounce of cremor tartar, finely levigated, and given every 4th or 6th hour, to restore patients to health, "who would, he thinks, have sunk under any of the modes of treatment in use."

Emetics were formerly much prescribed in this disease; and they deserve, in fact, much more attention in the management of this affection, than they appear at present to receive. Cleghorn considered active emesis, produced by a combination of ipecacuanha and the cerated glass of antimony, as particularly useful in cases that begin like simple diarrhœa. We have also the testimony of Monro, Cullen, Pringle, Zimmerman, and Richter, in favour of this class of remedies in dysentery; and among the more recent writers who speak favourably of this practice, we may mention Chisholm,* Johnson, O'Brien,† and Cheyne. I have myself had many examples of the good effects of emetics in the commencement of the disease. Pringle and Cleghorn recommend the cerated glass of antimony. The former states that he has used this remedy with success, after other articles had failed. The harshness of its operation, however, has induced physicians generally to relinquish it. Chisholm thinks

* A Manual of the Diseases of Tropical Climates. London, 1822.
† Observations on the Acute and Chronic Dysentery of Ireland. Dublin, 1822.

the sulphate of zinc preferable to any other article of this kind. Many practitioners prefer ipecacuanha, and indeed this article appears to me properly entitled to preference as an emetic in this disease. It is at once mild and certain in its operation, and generally causes a perceptible increase of cutaneous exhalation. But its peculiar advantages over other emetics in this disease, arise from its tendency to allay intestinal irritation, and of increasing, rather than impairing the tone of the stomach. Emetics are especially indicated when the tongue is coated with a brown fur along its middle, and where much nausea and bilious vomiting occur in the beginning of the disease. The usefulness of this class of remedies, is, however, in a great measure, restricted to the early part of the disease. It is not probable that the beneficial effects of emetics in this affection, depend merely on their evacuant operation. The concussion which the act of vomiting causes in the abdominal viscera, excites the portal circulation, which is always more or less in an engorged state in dysentery; promotes the activity of the hepatic function; and finally strongly determines the circulation to the skin.

Diaphoretics.—Such is the intimate relation which subsists between the external and internal surfaces of the human body, that the inordinate excitement of the one is always attended with a diminution of action in the other; and hence in all diseases of the intestinal canal, connected either with high irritation or inflammation, the skin is dry and harsh; and hence, too, the excitation of the cutaneous exhalents, generally contributes greatly to the removal of such affections. Sudorifics have, indeed, long held a primary rank among the remedies for dysentery.* Some difference of opinion has been expressed with regard to the comparative usefulness of free sweating, and of mere gentle diaphoresis in this affection. In general, a uniform moisture of the skin will, I think, procure all the advantages which can be obtained from remedies directed to the skin. After the bowels have been adequately evacuated by mild purgatives, and the general arterial excitement moderated by venesection, where this measure is indicated by the state of the pulse, diaphoretics in conjunction with calomel, are valuable curative means. For this purpose, the *pulvis ipecacuanha compositus*, is probably the best article we possess. It may be given according to the following formula:

℞. Pulv. ipec. compos. gr. xxiv.
Submuriatis hydrarg. gr. vi.
M. Divide into six equal parts. S. Give one every three or four hours.

* Mosely asserts, "that intermittents are not cured with more certainty by the Peruvian bark, than dysentery by sudorifics." This encomium, however, is *ultra rem tendere.*

A combination of opium and ipecacuanha also forms an excellent diaphoretic in this disease: from one to two grains of the latter, with one-fourth of a grain of the former, may be given every two or three hours, until diaphoresis occurs. Dr. O'Brien asserts, that a combination of opium, calomel, and James's powder, forms one of the most powerful anti-dysenteric remedies we possess, and Dr. Johnson concurs with him in this observation. Much benefit may likewise be obtained from a combination of from fifteen to twenty grains of the powdered root of *Asclepias tuberosa*, half a grain of ipecacuanha, and a quarter of a grain of opium, given every two or three hours. About seventeen years ago, while practicing in Lancaster County of this State, I frequently employed this combination, and the result was in general decidedly beneficial. The employment of diaphoretics should be accompanied with the free use of tepid mucilaginous diluents.

Calomel, with a view to its constitutional influence, is a remedy of excellent powers in this disease. It may be conveniently and advantageously given in union with diaphoretics. It is unnecessary to cite authorities in support of the usefulness of this remedy in dysentery. Nearly all those who have published their experience in relation to this affection, concur in their statements respecting the good effects generally derived from a greater or less degree of mercurial influence in this disease. It is, indeed, seldom necessary to excite ptyalism—the slightest mercurial action being generally sufficient to obtain its curative effects in the dysenteries of the temperate latitudes. In hot and insalubrious climates, the disease frequently makes its attack with great violence, and passes rapidly through its course. The liver generally suffers prominently, and often becomes disorganized in a few days. In cases of this kind, the sooner the system is brought under the full influence of mercury, the greater, in general, will be the chance of the patient's recovery. (Ferguson, Johnson.)

Opium was, by the authority of Cullen, for a considerable period, almost wholly excluded from the list of remedies proper in dysentery. Sydenham, long before, had a more correct opinion concerning the value of this narcotic in this affection. "So important," he says, "is opium in the hands of a skilful physician, that without it his hands are, as it were tied, and his power of doing good in dysentery greatly diminished." Dr. Stokes states that cases came before him, during the epidemic dysentery in Dublin, in 1818, in which the ordinary plan of treatment by diaphoretics, purgatives, and calomel, appeared to make no impression on the disease. These cases were attended with intolerance of the slightest pressure on the abdomen, agonizing pain, unceasing tenesmus, and great pyrexia. In these instances,

opium in large doses, in conjunction with copious bleeding and scruple doses of calomel, often procured decided relief. "Were the same cases again placed under my care," he says, "I would not hesitate to give opium in doses of four or five grains, as it was the opium chiefly which seemed to me to arrest the progress of the inflammation."

It should be observed, however, that though a valuable remedy in this disease, opium should not be freely given in the *beginning* of the complaint, more especially when the febrile reaction is of a vigorous grade. In such cases, decisive blood-letting should be premised. But even in cases of this general phlogistic character, *small* doses of this narcotic, in conjunction with laxatives, generally afford considerable benefit. After the disease has continued for two or three days, more frequent doses may be given in the diaphoretic combinations mentioned above. As the disease advances, opiates will become more and more necessary; and in the chronic form, or where the febrile reaction is weak, they are of primary importance. From what I have witnessed in a few cases, during the present season, I am inclined to think that the *sulphate of morphia*, dissolved in a considerable portion of some bland mucilaginous fluid, as flaxseed tea, or decoction of the slippery elm bark, constitutes a peculiarly beneficial form for administering opium in this affection. One quarter of a grain in a cup of mucilaginous liquid, may be taken every four, or six, or eight hours.

The *nitrous acid*, in conjunction with opium and camphor, is strongly recommended by Dr. Hope, of Chatham. He states that he has been in the habit of using this combination for more than twenty years, and with very marked advantage.* It may be given thus:

℞. Acid. nitros. ʒi.
Mistur. camph. ℥viii.
Tinct. opii gtt. 80.
M. S. Take the fourth part of this mixture every three or four hours.

We are informed by Dr. Johnson, that the *nitrous acid* has long been used in India in this complaint, and generally with much advantage.† He has himself found it very useful in chronic bowel complaints succeeded by acute ones. In a single case of obstinate subacute dysentery, I have lately used the *pyroligneous acid* with marked success. The discharges, previous to the employment of this article, were very offensive—but in the course of twenty-four hours they were greatly improved both in appearance and smell; and the patient soon began to convalesce

* Edinburgh Medical and Surgical Journal, 1826.

† See also Observations on the Effects of Nitric Acid and Opium in the Cure of Dysentery.—*Med. and Phys. Journ.* vol. iii.

under the employment of this remedy, in conjunction with small doses of Dover's powder, calomel, and prepared chalk.

Sugar of lead has also been used, in union with opium, as well as by itself, in dysenteric affections. Dr. Burk, of Dublin, gave it with very excellent effect, according to the following formula:

℞. Acetat. plumbi gr. iv.
Tinct. opii ʒii.
Aq. distillat. ℥ii. M. S. Take from ʒss. to ʒi. every third or fourth hour.

In this city, opium and sugar of lead have been used by a few practitioners; and, as it is alleged, with considerable advantage. (Dr. Harlan.) That this astringent may sometimes prove serviceable in the advanced periods of the disease, I have myself had convincing testimony. In general, however, all astringents, of whatever kind—but certainly, more especially vegetable astringents, are improper in the early stages of this complaint, and very often wholly useless, if not injurious, even at later periods of the disease. There may occasionally be found modifications of dysentery, in which this class of remedies will do much good; and of this kind was the *scorbutic* dysentery described by Dr. Bampfield. In general, astringents appear to be much better adapted to the management of this disease, as it occurs in tropical climates,—especially after the mercurial action has been gone through, and the bowels freely evacuated by laxatives. When in the advanced stage the morbid secretions continue after the inflammatory symptoms have been subdued, astringents will sometimes afford considerable advantage. Under such circumstances, we may use the decoctions of cusparia, logwood, or the root of geranium maculatum or of Heucrea Americana. Abercrombie says that he has used powdered charcoal, in combination with Dover's powder, with decided benefit, in a severe case of this disease.

The hydro-chloruret of lime, also deserves attention as a remedy in this affection. According to the experience of Dr. Reed of Dublin, it is capable of procuring great benefit; and it has lately been used in Germany, as I learn by a private communication, with very decided advantage. Dr. Reed directed a solution of ten grains of this salt, in two drachms of tincture of Colomba, diluted with four ounces of water, to be taken in half ounce doses.*

The *nux vomica* was formerly much used in some parts of Europe, in the treatment of dysentery. Hagstrom, a Swedish physician, asserts that he found this article of very great service in this affection; and Hufeland states, that in an epidemic of this

* Med. Chir. Rev. Jan. 1828. p. 42.

disease at Jena, in 1795, he obtained great benefits from this powerful narcotic. (Alibert.) From one to two and a half grains of the powdered nut should be given every two hours, after purgatives have been effectually used, and the general phlogistic excitement moderated by venesection, where it is inordinate. Schmidtmann, a German physician of great experience and celebrity, observes, that he has found this article useful in allaying the tormina, and diminishing the frequency of the evacuations; but that it appeared to him to increase the violence of the tenesmus; and the same observation has been made by other writers. Opium is a much safer and better remedy, where a narcotic may be deemed proper; and to this article, accordingly, I always give a decided preference.*

Tobacco also is ranked among the useful remedies in dysentery. Dr. O'Brient employed it in the form of enemata, in the proportion of 10 grains of the tobacco to six ounces of boiling water, and directed the abdomen to be fomented with an infusion of the strength of two ounces to two pounds of boiling water. When thus employed, tobacco is said to moderate the action of the heart and arteries; allay the intestinal spasm; promote free purgation; relieve the tormina and tenesmus; and restore the free action of the cutaneous exhalents.

Local bleeding by *leeches* is recommended by some, and it is most assuredly clearly indicated in this affection. It does not appear, however, from the testimony we have on this point, that the degree of advantage usually obtained from this practice, is often as great as one might reasonably expect. In infants or young children, leeching seems to be more beneficial in this disease than in adults. Nevertheless, where there is much abdominal tenderness to pressure, and the general momentum of the circulation has been moderated by venesection, great relief is sometimes obtained from thirty or forty leeches applied over the lower part of the abdomen. Where leeches can be procured, this mode of depletion ought, certainly, not to be neglected, especially in obstinate cases, or in such as approach to a chronic character.

Blisters applied to the abdomen will sometimes do considerable good in cases attended with much tenderness and pain in the abdomen; but I have often known them applied without any perceptible advantage. From considerable experience with fomentations and large emollient poultices applied over the abdomen, I have been led to regard them of more service in this affection than vesicatories. In the dysenteries of children, particularly

* Ab anno 1800; says Schmidtmann, omissa nuce vomica semper unice opio usus fui, quod nunquam mea fefellit vota: fere semper adjunxi calomel.—*Summa Observationum Medicarum.* tom. iii. p. 202.

† Loco Citat.

after leeching, I have derived much benefit from the application of an emollient poultice to the abdomen. Stimulating embrocations may prove serviceable in the *chronic* form of the disease. For this purpose, a mixture of the oil of *monarda punctata* and camphorated spirits, in the proportion of an ounce of the former to two ounces of the latter, forms an excellent article. Where there is much abdominal tenderness, a portion of laudanum may be advantageously added to this mixture. After frictions with articles of this kind, which should be repeated three or four times daily, a broad flannel roller should be tightly worn around the body in *chronic* dysentery.*

In chronic dysentery, *balsam copaiva* frequently does excellent service. Pemberton, Johnson, and Cheyne speak very favourably of its use in this form of the disease. I have employed it with unequivocal benefit. It may be given thus:

℞. Bals. copaiv. ʒss.
Pulv. g. arab. ʒii.
Sacch. albi ʒiii.
Aq. fontanæ ʒviii.
Tinct. opii ʒi.
M. S. Take a table-spoonful every four hours.

Dr. O'Brien, who used this article with much success in chronic dysentery, states, that the best mode of correcting its disagreeable taste, is to give it in warm milk, with which it readily mixes by means of sugar. In very protracted cases, unattended with much general febrile irritation, the spirits of turpentine occasionally proves decidedly beneficial. From 10 to 20 drops, suspended in some mucilaginous fluid, should be given every three or four hours. I have, in several cases, prescribed this article with complete success. Small doses of Dover's powder with prepared chalk, is a very useful remedy in the chronic form of the disease. From three to four grains of the former to ten or twelve of the latter may be given every three or four hours; and this combination may be beneficially employed in conjunction with the balsam copaiva. In this state of the disease, considerable benefit has been derived from infusion of some of the vegetable astringents—particularly logwood. I have used a decoction of the root of geranium maculatum in milk, with very good effect in chronic dysentery. Abercrombie recommends a strong decoction of cusparia with nitric acid and laudanum.

Anodyne and emollient *enemata* are almost always highly useful in the treatment both of acute and chronic dysentery. They are particularly beneficial in the dysenteric affections of infants and children. Infusion of flaxseed—of slippery elm—of althea—or a liquid preparation of starch, with a full dose of laudanum,

* Dewar on Dysentery.

should be thrown into the rectum two or three times daily. Injections of this kind, even without the anodyne, rarely fail to relieve for a time the distressing tormina and tenesmus; and they predispose the bowels to more free evacuations from the operation of purgatives. Some speak very favourably of injections of the infusion of *ipecacuanha* in this affection.

During the whole course of the disease, mucilaginous drinks —such as solution of gum-arabic, flaxseed tea, infusion of slippery elm, of althea, or very thin preparations of arrow-root, barley-water, &c. should be freely allowed. The free employment of mucilaginous fluids is of great importance in the treatment of dysentery. From the commencement to the termination of the disease, liquids of this kind should be as copiously taken as the stomach will bear. In addition to the mucilages just mentioned, we may also notice that which is obtained by decoction from the pith of sassafras. This is a very agreeable mucilage, rarely nauseating the stomach, and from information I have lately obtained, it would appear to be peculiarly beneficial in this and other forms of mucous inflammation of the bowels. In children, fluids of this kind should be repeatedly thrown into the rectum—a measure which always greatly moderates the tormenting tenesmus. Every kind of solid food must be carefully avoided. Among the foregoing mucilaginous drinks, the infusion of slippery elm bark is, perhaps, the best. Along with its abundant mucilage, it possesses slight tonic powers—a combination of virtues which renders it particularly useful in cases of a subacute or chronic character. One ounce of the bark should be infused in a pint of boiling water. Mutton suet, dissolved in warm milk, is much recommended by some writers; and its effects are indeed often strikingly useful. A table-spoonful may be taken four or five times in the course of a day. Sir John Pringle speaks very favourably of yellow wax and Spanish soap melted together, as a remedy in dysentery. During convalescence from this disease, great caution should be used to avoid every kind of indigestible and irritating food. In general, some of the milder vegetable tonic astringents will contribute considerably to the speedy confirmation of health. A weak infusion of the dog-wood bark, or of cusparia with nitric acid, are excellent articles for this purpose. Rice, barley, oat-meal gruel, and boiled milk, are among the most suitable articles of diet after the subsidence of the disease.

Sect. VII.—*Of Chronic Enteritis.*

Chronic inflammation of the mucous membrane of the bowels, particularly of the lower portion of the small intestines and the colon, is a much more common affection than seems to be

generally supposed. Its symptoms are often so equivocal and obscure, that the disturbances which it creates in the system are frequently ascribed to any thing else than to a phlogosed state of the internal surface of the intestinal tube. Most of the cases that are usually called marasmus, liver complaint, and dyspepsia, consist in *chronic* mucous inflammation of the bowels. In this variety of enteritis, little or no distinct pain is experienced in the abdomen, except when firm pressure is made on the external surface. Pain and a sense of soreness however are usually felt on coughing, sneezing, or any sudden motion that causes a concussion of the abdominal viscera. Connected with these symptoms, there is always considerable languor and weakness of the muscular system; the pulse is small, weak, and sharp, or corded; the hands and feet usually cold; and slight febrile exacerbations occur towards evening, attended with flushed cheeks, and a burning sensation in the palms of the hands and soles of the feet. After eating, the patient is apt to complain of more or less sharp colic pain in the bowels. Diarrhœa is, in many instances, a constant attendant; and in some cases, diarrhœa alternates with costiveness. The appetite is often very variable and capricious —being sometimes voracious, and at others entirely gone. In the advanced period of the disease, articles of food taken into the stomach usually create much uneasiness until they are evacuated by the bowels in an imperfectly digested state. When this occurs, the patient emaciates rapidly; the abdomen in children becoming more and more tumid as the emaciation of the other parts of the body increases. The diarrhœal discharges are usually preceded by more or less tormina; and the discharges themselves vary much, both in frequency and appearance. They are sometimes slimy, mixed with more or less feces, and small in quantity; purulent and bloody; or abundant and watery; occasionally dark, or whitish; and pieces of undigested food often pass off with them.* The skin is generally dry, and of a sallow or dingy hue; sleep is interrupted and not refreshing; the tongue is almost always smooth and red round the margin, with a brown streak along the middle.† The temper is irritable, morose, or querulous, and a feeling of illness and suffering is depicted in the countenance. This form of mucous intestinal inflammation often continues for a long time without destroying life, but in

* Abercrombie states, "when the disease extends along the whole course of the colon, the feces generally come off in a liquid state, and in this case we may have the evacuations consisting sometimes of thin healthy feces, more or less combined with the morbid discharge; and, at other times, we may find the morbid discharge coming off without any appearance of feculent matter. When the disease is in the *small* intestines, we seldom see the peculiar discharge uncombined. It seems either to be small in quantity, or to come off so mixed with feces as not to be easily distinguished."

† Broussais, Phleg. Chron. vol. i.

many instances, the body emaciates rapidly, great weakness ensues, the mouth and fauces become aphthous, and the patient sinks under general hectic irritation. (Abercrombie.) Under the head of diarrhœa, this form of intestinal inflammation will be again considered; for nearly all instances of obstinate and protracted diarrhœa, consist, in reality, of chronic mucous enteritis, connected, frequently, with ulcerations.

Causes.—Chronic mucous enteritis may be the consequence of the acute form of the disease. It is, however, much more frequently the result of irritation from crude and indigestible food, and other irritating substances acting directly on the internal coat of the bowels. The protracted influence of a cold and damp atmosphere, particularly when aided by unwholesome and indigestible diet, is apt to give rise to this affection. Drastic and frequently repeated purges; and, in short, every thing of an irritating character admitted into the bowels may produce it.

Post mortem appearances.—The appearances on dissection are very various in this as in the other varieties of gastro-intestinal inflammation. Sometimes we find a number of red patches, with fungoid elevations in a greater or less extent of the mucous membrane; and ulcerations of different shapes and sizes almost always occur in some parts of this structure. Sometimes "there are extensive tracts of ragged ulceration alternating with fungous elevations." We sometimes find the internal surface of the colon, or the lower portion of the ileum, covered with ulcerated and indurated elevations; and frequently the area of a considerable portion of intestine is contracted, so as scarcely to admit a large sized bougie. It is now well ascertained, that ulcers of the mucous membrane of the bowels frequently cicatrize; and that such cases are not, therefore, to be regarded as altogether insusceptible of cure. Dr. Latham* in his account of the diseases of Milbank, relates examples of this kind; and the observations of Petit, (of the Hotel Dieu,) Andral, jun., and M. Billard, have furnished us with ample and interesting evidence of the cicatrization and cure of such ulcerations. M. Troillet has also related instances in which this important process was fully demonstrated. (Jour. Gen. Med. and Med. Chir. Rev. July, 1826, et passim.) M. Troillet, in giving an account of the dissection of a subject that had died of enteric inflammation, says: "the ulcerations were of an oval and round form, varying in diameter from six to ten lines, with fringed edges, and surround-

* Dr. Latham, in his account of the Milbank epidemic, says: "there was, however, one appearance not unfrequently met with in our examinations, with which I was not then acquainted. This was the appearance of ulcers in the mucous membrane of the intestines, in the course of their progress towards reparation." —*An Account of the Disease lately prevalent at the General Penitentiary.* By P. Marc Latham, M. D. London, 1825. 8vo. p. 286.

ed with a brownish circle, beyond which the mucous membrane was sound. They occupied the lower portion of the ileum. Their surfaces presented the following marks of incipient, advanced, and complete cicatrization. Those in the first state were covered with a fine pellicle, transparent even after being washed or scraped with the scalpel. It was in some degree moveable on the subjacent cellular substance. In other ulcerations, where the work of regeneration was more advanced, the pellicle was thicker, slightly opaque in some parts of its surface, and amalgamated, as it were, with the fringed edges of the sore. In those ulcers where the cicatrization was nearly completed, the pellicle had acquired the thickness, the consistence, and the aspect of the common mucous membrane. In those parts where the healing process had advanced to the greatest degree, the fringed condition of the edges had entirely disappeared; the surrounding circle was of a faint colour, or in some places annihilated, and the mucous membrane was completely regenerated."

Treatment.—Proper dietetic regulations are indispensable, and constitute, indeed, our most valuable means for combating this affection. The diet must be of the mildest kind, "and such as leaves the least feculence to pass along the intestines." Liquid *farinaceous* articles, such as preparations of arrow-root, oat-meal, barley, tapioca, rice, and sago, constitute the best nourishment in this affection. Boiled milk, rye-meal mush, boiled rice with sugar, and occasionally a poached egg, may also be used. Animal food, in a *solid* form, is inadmissible. These observances are indispensable to the successful treatment of this malady. No treatment, however judicious in other respects it may be, can avail, if the patient do not rigidly, and perseveringly, abstain from all kinds of solid or irritating aliment. Having given directions for the regulation of the diet, a mild laxative should be prescribed; and for this purpose, *castor oil* is perhaps the best article we possess. Broussais rejects, unreservedly, all kinds of laxatives, in this, as well as in the other varieties of enteritis. It can hardly be doubted, however, that the vitiated secretions, and acrid results of decomposition in the bowels, will be much more apt to make injurious impressions on the phlogosed mucous membrane, when suffered to accumulate, than the occasional transient stimulus of castor oil, with eight or ten drops of laudanum. My own experience, at least, has led me to this conclusion, although I am strongly impressed with the conviction, that active purgatives, and even laxatives, when *frequently* given, are decidedly injurious.

Leeches applied to the abdomen, are among our most efficient means for subduing the intestinal phlogosis. They should be applied, from time to time, to an extent corresponding with the patient's strength, and activity of the pulse. Much advan-

tage may also be obtained from the application of blisters to the abdomen; and, in a few instances, I have known decided benefit to be derived from pustulation with frictions of tartar emetic ointment. Wearing a flannel bandaged tightly round the body, sometimes proves serviceable, particularly after leeching, or rubefacient frictions to the belly.

Among the internal remedies most useful in this affection, are small doses of Dover's powder, with or without minute portions of calomel;* *balsam copaiva* in the form of an emulsion; and *spirits of turpentine*.†

It may appear inconsistent to recommend *balsam copaiva* and *spirits of turpentine* in this affection, after having declared that the most unirritating diet is a *sine qua non* in its treatment, and that *active* cathartics are injurious, on account of the irritation they produce in the phlogosed structure.

Whatever may be the conclusions of *reason* on this subject, *experience*, which is always our best instructor, teaches that both the articles in question are often decidedly beneficial in the present variety of intestinal phlogosis. There is nothing more extraordinary in this, than in what is observed in the treatment of some other varieties of inflammation. In *catarrhal ophthalmia*, soothing applications are undoubtedly proper; yet the application of a weak solution of lunar caustic, or of small portions of precipitate ointment, will very frequently produce an immediate amendment in the disease, whilst astringent washes seldom fail to do mischief. And we may, moreover, observe, that we apply turpentine to the inflamed skin from burns or scalds, and with great, and often immediate relief. There is a power in some articles, besides their general stimulant effects, to produce a *peculiar* excitement, which, in certain states of inflammation, is particularly salutary; and this appears to be the case with the articles just mentioned, in the present disease. These remedies should, however, be given in small doses; and they generally procure most advantage when administered in conjunction with mucilage, and small doses of opium, or of extract of hyoscyamus. Dr. Grenville speaks very favourably of the employment of sulphate of copper in affections of this kind; and Dr. Abercrombie observes, that he has found this article highly useful in this disease. The dose, at first, is half a grain, combined with an equal quantity of opium, and gradually increased, if necessary, to the

* ℞. Pulv. ipecac. compos. gr. xxxii.
Calomel gr. i. M. Divide into eight equal parts.
S. Take one every five or six hours.

† ℞. Spir. tereb. ℥ss.
Vitel. ovi.
Sacch. albi. ℥ss.
Aq. fontanæ ℥iii.
Tinct. opii ℥iss. M. S. Take a tea-spoonful three or four times daily.

extent sometimes of three grains with half a grain of opium three times daily. Dr. Elliotson also has published cases illustrative of the good effects of this remedy in chronic inflammation of the mucous membrane of the bowels. "I had two very severe cases," he says, "in which the quantity of blood and matter evacuated, and the wretched appearance of the countenance, rendered the existence of great disease of the inner surface of the intestines probable, and which would most likely have proved fatal but for this remedy. Both these men recovered, after having taken the medicine about six months." These patients took the sulphate of copper with opium, in doses of three grains, three times daily.*

I have employed a decoction of the slippery elm bark, in conjunction with occasional leeching, and the use of small doses of balsam copaiva, with the happiest effect in several instances of this disease.

Sect. VIII.—*Of Acute Peritonitis.*

Acute inflammation of the peritoneum is frequently ushered in by a feeling of lassitude ; pain in the limbs ; and slight creeping chills, alternating with flushes of heat. Headach, and a sense of weight or uneasiness in the epigastrium, are usually among the first symptoms. Acute pain is often felt in some part of the abdomen, at the very commencement of the disease. Occasionally, however, the pain does not occur until the febrile reaction is established, and in some instances it comes on suddenly, with much violence during or immediately after the first sensation of chilliness. The abdominal pain is frequently, for a time, confined to a small space, but it generally soon spreads throughout the whole or a greater part of the abdominal cavity. Pain does not, however, always occur in this affection. In some instances of the most aggravated character, little or no pain, but only slight uneasiness, is felt in the abdomen—(Andral.) Sometimes the abdominal pain "moves irregularly about, remaining for a few hours in one spot, and suddenly removing to another." *In all instances, pressure on the external surface of the abdomen is extremely painful.* To avoid this source of suffering, the patient lies on his back, with the knees and shoulders raised, in order to take off the tension of the abdominal muscles, and the pressure of the bed-coverings. The bowels are constipated, or moved with considerable difficulty ;† the pulse is frequent, more

* Med. Chirurg. Transactions.

† "Constipation," says Dr. Johnson, "is as general a concomitant of peritoneal inflammation, as dysenteric purging is of inflammation of the mucous membrane of the intestines."—*Med. Chir. Rev. Sept.* 1820, p. 167.

or less tense, contracted, and sharp, and occasionally, though rarely, it is round and full. The tongue is moist, and at first covered with a thin white fur, the edges and raphe becoming sometimes red in the progress of the malady. In many instances, the stomach sympathizes strongly with the abdominal affection, the patient being harassed with frequent nausea and vomiting in the early stage of the disease. The face is usually pale, exhibiting a peculiar sharpness of feature, and an expression of great anxiety. Constant wakefulness is very commonly present throughout the whole course of the disease, but delirium rarely occurs except towards the conclusion of fatal cases. Generally, in the course of from twenty-four to thirty-six hours, the abdomen becomes tumid, tense, and elastic, from flatulent distention of the intestines; and extremely tender. Respiration is oppressed and laborious in the latter period of the disease; *inspiration*, especially, being short, difficult, and attended with an expression of pain in the countenance. The secretion of urine is almost invariably more or less diminished, and in some instances almost wholly suppressed. When the peritoneal coat of the bladder is the seat of inflammation, "the evacuation of the urine will almost uniformly be suspended," and much pain felt in the pelvis. The peritoneal covering of the inferior surface of the diaphragm is occasionally the principal or sole part of this membrane which is inflamed, and in this case almost constant hiccough attends—(Scoutteten.)* When peritonitis occurs in the puerperal state,—constituting what is usually termed puerperal fever, the lochia almost always cease to flow; and the secretion of milk becomes arrested or greatly diminished. In cases of this kind, the general powers of the system usually sink much earlier than in cases occurring in males or in females not in the puerperal condition.

Acute peritoneal inflammation is generally very rapid in its progress. It seldom continues beyond the sixth or seventh day without terminating either in resolution or in death, or passing into the chronic or subacute state. It often terminates fatally as early as the third day; and Andral asserts that its progress is occasionally so rapid, "that only a few hours intervene between the origin of the inflammation and death." But when the inflammation assumes the *subacute* grade, it is frequently prolonged to the thirtieth or fortieth day before it proves fatal. Acute peritonitis is particularly prone to terminate in gangrene. When this occurs, the abdominal pain suddenly subsides; the pulse becomes very small, frequent, and often intermitting; great muscular prostration ensues; the extremities become cold and clam-

* Med. Chir. Rev. June, 1824, p. 199. See also, *Archives Generales*, &c. for December and February, 1824.

my ; and the countenance pale, hollow, and contracted. Slight wandering delirium usually occurs at last, in cases that terminate in this way.

Causes.—Acute peritonitis may be produced by mechanical injuries of the abdominal viscera ; violent and long-continued corporeal exertions ; stricture of the colon and rectum ; perforation of the stomach or bowels by slow ulceration, and the consequent passage of the ingesta or feces into the cavity of the abdomen ; extravasation of blood, urine, or bile, into the peritoneal cavity ; the action of cold on the surface of the body, causing sudden suppression of the perspiration ; wet and cold feet ; drinking cold water while the body is in a free state of perspiration ; *parturition ;* sudden suppression of the hæmorrhoidal discharge, or of the menses ; metastasis of erysipelas (Abercrombie ;) and of *rheumatism*,* and it would appear a peculiar *contagion*, to which females are liable soon after parturition.

Post mortem appearances.—Pathological investigations have now fully established the fact that the peritoneum may be violently inflamed without the inflammation extending to the subjacent structures. That portion of this membrane which covers the stomach, intestines, and other viscera, has often been found strongly inflamed, and even gangrenous, while the other structures of these organs were perfectly sound. (Broussais, Abercrombie, Armstrong.) In some cases the peritoneum exhibits large patches of a deep-purple, and occasionally even of a black colour. Strong adhesions between the intestines very frequently occur ; and in some instances there is more or less adhesion formed between the intestines and the inner surface of the abdominal cavity. Scoutteten found, in several instances, subperitoneal emphysema. Sometimes these adhesions are formed without the intervention of false membrane, (Scoutteten,) but much more frequently pseudo-membranous layers form the bond of union. White membraniform concretions are generally found also on different parts of the peritoneal surface of the stomach, liver, and bowels. Effusion into the abdominal cavity, of a whitish fluid containing small flocculi of lymph, or of a reddish or yellowish fluid, almost always occurs. *Blood* has been found effused into

* Andral, jun. has related a case of peritonitis which manifestly arose from translated *rheumatism*. (Repert. Générale, &c. No. 4.) Dr. James Johnson, in reference to this case, observes : "We think the most sceptical pathologist will hardly deny that there was in this case a transference of inflammation from the joints to the peritoneum." This patient was received into *La Charité* whilst labouring under acute rheumatism. *Several venesections* were practised. After some days the rheumatism suddenly ceased, and acute pains soon came on in the abdomen. The abdominal pain speedily acquired great violence, and death took place on the third day from the disappearance of the rheumatism in the joints. On dissection, strong and extensive signs of inflammation were detected in the peritoneum.

the abdomen in acute peritonitis. In some cases the fluid is thick, and of a straw-colour, "resembling diluted pus with a very peculiar odour;" and in other instances, a soft, white, sebaceous matter, resembling soft butter, is found deposited in the interstices formed by the convolutions of the intestines. Andral found a number of small tubercles between the peritoneal and mucous membranes of the bowels, some of which were softened down, and had burst through the peritoneum. In nearly all instances, a greater or less extent of the peritoneum is found strongly injected.

The occurrence of effusion, or suppuration into the abdominal cavity, is generally announced by a diminution of the pain and tenderness of the abdomen, attended with a sense of weight and oppression in the hypogastric region; rigors; coldness of the extremities; a soft and feeble pulse, and sometimes slight diarrhœa.

Treatment.—The first and most important remediate measure in the treatment of acute peritonitis, is *blood-letting*. There is no inflammatory affection, in which prompt and decisive bleeding is more essential to success in its treatment, than the present one. No definite directions can be given as to the quantity of blood which it may be necessary to draw. The first bleeding ought to be carried to the extent of making a very obvious impression on the system; and it should be repeated as soon as the pain and febrile reaction rise again, if the first do not break up the violence of the disease. I have opened a vein three times in as many hours, before a permanent impression was made on the disease. The period during which blood-letting may be employed with a prospect of advantage in this disease, is in general limited to the first twenty-four hours from its commencement; and in many instances, a lapse of twelve hours will render this powerful remedy abortive, or even detrimental. When blood is promptly and very efficiently abstracted, soon after the inflammation is developed, the disease is often prostrated at once, so as to yield without much difficulty to other suitable measures.

After the violence of the local and general symptoms has been in some degree subdued by venesection, topical bleeding from the abdomen with leeches will in general contribute considerably to the further reduction of the peritoneal inflammation. The abstraction of blood by leeches is generally much more beneficial in peritonitis than in any other variety of abdominal inflammation, and should, indeed, always be resorted to, whenever leeches can be procured. After leeching has been employed, it will be useful to apply a large emollient poultice over the abdomen, which will keep up a moderate discharge of blood, for some time, from the leech-bites; and by its relaxing effect tend to promote the cutaneous exhalation from the external abdominal surface.

Instead of a poultice, cloths wrung out of hot water may be kept applied to the abdomen with advantage.

As soon as the abdominal pain and tenderness are somewhat moderated by the means just mentioned, a stimulating purgative should be administered, in a dose sufficiently large to excite active purging. The employment of active cathartics in this disease, deserves to be regarded as a highly important measure. In no case can they be omitted without losing the benefit of a valuable remedy. In nearly all instances of peritoneal inflammation, there is considerable difficulty in moving the bowels; and it generally requires strong doses of the most active articles of this kind to procure free evacuations. The advantages which purgatives afford in this disease, are usually proportionate to the activity of their operation. This does not accord, however, with the observations of Broussais, who affirms, that active purging is hurtful in peritonitis, on account of the vermicular contractions which it excites in the intestines, and its consequent increase of the morbid sensibility of the peritoneum. Dr. Abercrombie also regards active purgation as seldom necessary, and often detrimental in this disease. Independently, however, of the many authorities of the first respectability, that might be cited in favour of the use of active purgatives in this malady, I have too often had the most unequivocal evidence, in my own practice, of the decided usefulness of purging in peritoneal inflammation, to admit, in my mind, of any doubt concerning the efficacy of this practice. Upon this point, Dr. Johnson makes the following judicious remarks: "In abdominal inflammation, provided the mucous tissues are not inflamed, purgatives excite the secreting vessels, not only of the whole internal surface of the intestines themselves, but of the glandular organs whose secretory ducts open into the primæ viæ, and thus powerfully deplete locally the vascular system of the abdominal viscera. When the portion of the peritoneum reflected over the intestines is inflamed, but where the villous coat is unaffected, I hesitate not to assert, from personal experience, that constipation of the bowels will, in nine cases out of ten, be a feature of the disease; and in such cases I maintain, that to excite the natural action of the mucous membrane, immediately after proper vascular depletion, is a very powerful means for checking the peritoneal inflammation; in the same way that a free expectoration from the mucous membrane of the bronchia, relieves the vascular turgescence and inflammation of the parenchymatous structure, or pleural covering of the lungs."* By stimulating the mucous membrane with purgatives, we not only deplete the abdominal vessels generally, but also strongly

* Med. Chir. Rev. September, 1820.

determine the circulation from the peritoneal capillaries to those of the former membrane.

Of all our purgatives, *castor-oil* in union with *spirits of turpentine*, has appeared to me the most valuable in the present affection. I have, in a considerable number of instances of puerperal peritonitis, derived signal advantage from this remedy.* I have usually prescribed it according to this formula:

℞. Ol. Ricini ℥ii.
Spir. terebinth. ʒvi.
M. S. Take the half at once, and the remainder in two hours, if purging has not commenced.

It is not always necessary, however, to resort to the use of this active purgative at once. In some instances, a full dose of calomel and jalap, or of infusion of senna, or of castor-oil, will procure adequate discharges; but where these articles fail to produce the desired effect, the turpentine and castor-oil in union, will usually bring on copious purging. I have used with much advantage, a mixture of cremor tartar and powdered jalap in this affection. This will seldom fail to produce very abundant watery discharges from the bowels. There are few articles which excite so copious a discharge from the intestinal exhalents as cremor tartar; and when given in union with jalap, its operation is generally prompt and active. From twelve to fifteen grains of the jalap to forty grains of cremor tartar, may be given every hour until the bowels are freely moved. Dr. Pring strongly recommends the use of calomel in puerperal peritonitis, in ten grain doses every six or eight hours. "Copious stools," he says, "quickly followed a sudden salivation, and a favourable convalescence was afterwards maintained by purgatives of the weaker sort."

The application of a *blister* to the abdomen will often do considerable good, where, after decisive blood-letting and purging, some tenderness on pressure remains on the inflamed parts. Leeching, if practicable, should, however, always be premised to vesication; but neither of these local means can be resorted to with a prospect of much benefit, until the acute character of the disease has been subdued by prompt and copious general deple-

* In one remarkable case of peritonitis, I endeavoured to procure purging by means of calomel and jalap and infusion of senna, without success for a whole day. The disease had acquired so great a violence that I had nearly lost all hopes of the patient's recovery. Finally, I ordered a mixture of two ounces of castor-oil with six drachms of spirits of turpentine, and directed the patient to take a table-spoonful every half hour. After the fourth dose, purging began, and brought off an enormous quantity of dark-coloured and extremely offensive fecal matter. The patient was greatly relieved by this evacuation, and could bear considerable abdominal pressure, which before was insupportable;—in short, all the symptoms were strikingly mitigated. Convalescence soon ensued under the use of purgatives, and a large blister to the abdomen.

tion. The blistered surface should be dressed with some application capable of keeping up a free discharge; and for this purpose, the *mercurial ointment* is, perhaps, the most useful in the affection. Mercurial frictions have indeed, of late, been particularly recommended in the treatment of this disease. M. Velpeau has reported four cases (Rev. Médicale, Jan. 1827,) in which two drachms of mercurial ointment, applied by frictions to the abdomen every two hours until the mouth became sore, appeared to do much good. M. Laennec also cured several cases of *subacute* peritonitis by mercurial frictions. As soon as the mouth became sore, the symptoms began to decline. (Rev. Médicale, Mai, 1824.) I have met with one case in which the supervention of the mercurial action appeared to exert a strong influence in arresting the further progress of the disease. This was a very acute case. Copious venesection was practised, and large doses of calomel administered with castor-oil as purgatives; on the third day, the mouth was found to be sore and the breath fetid; convalescence speedily ensued.

Among the internal remedies beneficial in this disease, *opium* with *calomel* deserves to be particularly mentioned. After the violence of the local and general symptoms has been broken down by energetic venesection, leeching and purging, we may, in general, resort to this combination with great advantage. I can speak with much confidence of the usefulness of this remedy, having, for the last ten years, employed it in this disease with unequivocal benefit in a considerable number of instances. In *puerperal* peritonitis especially, opium either alone or in combination with calomel, is often peculiarly serviceable. "In puerperal fever," says Dr. Armstrong, "in which the peritoneum chiefly sustains the intensity of the inflammation, *opium* may be given with considerable advantage, particularly when the local pain and constitutional irritation are excessive; though in that stage of excitement, it must not for a moment be forgotten, that bleeding and purging are the principal measures. When the stage of collapse approaches, opium may, perhaps, be accounted the primary measure, since the allaying of irritation is then the principal object. Whenever opium is administered in any species of abdominal inflammation, the *dose should be large;* for a small dose often stimulates, whereas a large one is a direct sedative." This narcotic may be very usefully administered in this affection at the same time that cathartics are employed; for opium in large doses, whilst it allays the pain and general irritation, often manifestly promotes the operation of purgatives in peritoneal inflammation. I have usually prescribed this article in combination with calomel, in the proportion of two grains of the former to three of the latter every three or four hours.

Antimony and nitre are seldom admissible in this disease, on

account of the great gastric irritability which usually prevails. Digitalis has been recommended as a useful article in this affection. When the pulse remains irritated and sharp, after the disease has been in a great degree subdued, digitalis in small, but frequent doses, may be advantageously used. One grain should be given every two or three hours, until the frequency and tension of the pulse is sufficiently moderated. Most practitioners employ this remedy in much larger doses than the one just mentioned; but I have generally found the action of the pulse more speedily moderated when given frequently and in small portions, than in larger ones at longer intervals.

When a state of collapse ensues after the inflammation has been overcome by the means already mentioned—an event which occasionally occurs in puerperal peritonitis—it must be counteracted by the employment of stimulants. Wine, the carbonate of ammonia, opium and camphor, and Dover's powder with quinine, are the best articles for this purpose. "There is a period in some cases of abdominal inflammation where the disease is just subdued, but where there is a kind of balance between recovery and gangrene. The pain will vanish; the pulse become weak; the vital powers appear to sink, and a coldness overspread the body. The symptoms are too often indicative of mortification; but every experienced practitioner must have occasionally witnessed cases of recovery even from this alarming state. Here we must give wine; for, if gangrene *have* commenced, no harm can ensue from the remedy; and if it have *not* commenced, the wine may happen to give a salutary stimulus to the nervous and vascular systems, when stagnation of the vital fluids is on the point of taking place, and where further evacuations would be instant death."—(Johnson.)

The nourishment throughout the whole course of the disease should be of the mildest and weakest kind. A little thin barley or rice-water, may serve at once for food and drink. The greatest care must also be taken to guard the patient against taking cold during the period of convalescence; as a renewal of the disease, in a subacute form, is extremely apt to occur from this and other exciting causes.

Sect. IX.—*Of Chronic Peritonitis.*

The approach of *chronic* inflammation of the peritoneum, when not the sequel of the acute form of the disease, is so gradual and insidious, that it seldom becomes the object of medical attention until incurable structural changes have taken place, or effusion into the cavity of the abdomen. It is only by attending to the passage of the acute into the chronic form, that we are

enabled to give an account of the early symptoms of the latter. When the peritoneum becomes affected with chronic inflammation, more or less uneasiness and tenderness is experienced in the abdomen; and when pressure is made externally, or the patient coughs, sneezes, or performs any sudden motion by which a concussion of the body is produced, a feeling of soreness is felt about the umbilical region. In many instances, there is slight pain in some part of the abdomen, which may be either continuous or occasional. In no instance, however, is the abdominal pain severe; for serous membranes in a state of chronic inflammation never give rise to acute pain; and many cases are recorded in which this structure was found completely disorganized from chronic inflammation, without the patient having complained of any pain whatever. The abdomen generally becomes fuller, and in some instances elastic, or more or less tympanitic. Frequently, a sense of tightness and pricking soreness is felt across the lower part of the abdomen, after fatigue from bodily exertion. "There is no tension of the skin of the abdomen as in the acute species; on the contrary, the skin and abdominal muscles often sit loosely upon the peritoneum, which gives a sensation to the touch, as of a tight bandage underneath, over which the skin and muscles may be felt as it were to slide. The patient always complains more of tightness than of pain; and as the tightness is much increased by any congestion in the bowels, the relief which he experiences from evacuating their contents, leads him to attribute his sensations to an habitual costiveness."*

On feeling the external surface of the abdomen, we sometimes find deep-seated spots of induration which are more or less tender to the touch. (Abercrombie.) In some instances, the patient experiences a sensation as if a ball were rolling about the abdomen. Broussais ascribes this sensation to the adhesion between the different convolutions of the intestines into a round and moveable mass. Such adhesions between the coils of the intestines may be suspected, says Armstrong, "by a lobulated or irregular feel of the bowels under the hand when passed over the abdominal integuments." The bowels in this affection are generally torpid. The pulse is often not perceptibly affected; except in the advanced periods of the disease, and towards evening in the early stage, when it usually becomes jerky or somewhat accelerated, quick, and contracted. The appetite is generally sufficiently strong, nor is the function of digestion particularly disordered; but in some instances, vomiting occasionally occurs. The face and whole surface of the body are generally pale, with an expression of ill-health and languor in the countenance. Slight febrile exacerbations towards evening, with

* Pemberton on the Viscera.

more or less oppressed respiration and cough when the patient lies horizontally on the back, and the appearance of œdema of the feet with paucity of urine, are pretty certain indications that effusion is taking place in the abdomen. The affection is not unfrequently connected with disease of the lungs.

Chronic peritoneal inflammation varies greatly with regard to its duration. It sometimes terminates in fatal disorganization and effusion within a few months; and cases occur which continue in a very slow and insidious way for many months, and even for several years, before the system is worn down by the general irritation it ultimately causes. Whether protracted, or short in its course, this affection of the peritoneum always terminates in more or less effusion, or suppurative secretion into the cavity of the abdomen. In truth, ascites is, in the majority of cases, dependent on a low degree of inflammatory irritation of the peritoneum.

Causes.—Chronic is frequently a sequel to *acute* peritonitis. It sometimes occurs as the consequence of acute mucous inflammation of the intestinal canal,—the inflammation passing from the former membrane to the peritoneal covering of the bowels. This is indeed no uncommon occurrence. I have met with two instances of subacute peritonitis, which came on in consequence of dysentery; and one other remarkable case which supervened on acute mucous inflammation of the bowels brought on by irritating ingesta. Dr. Hodge of this city has given an account of a well marked case of this kind, which was evidently produced by dysenteric inflammation.* Long continued torpor and congestion of the portal system from hepatic torpor or protracted constipation, is probably sometimes the cause of this affection. It may also be the consequence of acute or chronic inflammation of the solid viscera of the abdomen—particularly of the spleen and liver. Blows or injuries inflicted on the abdomen; difficult parturition; suppression of perspiration, and of hæmorrhoidal discharge; metastasis of erysipelas; cold, &c., will sometimes give rise to this affection.

Post mortem appearances.—More or less fluid is invariably found effused into the cavity of the abdomen in those who die of this affection. This fluid is commonly of a whitish or wheylike colour; sometimes it is limpid and yellow; and occasionally it is found of a reddish appearance, with small flocculi of false membrane floating in it. Occasionally, though rarely, the extravasated fluid is mixed with a considerable portion of blood; and instances occur in which it appears to consist of pure blood. (Scoutteten.) I have met with a case of this latter kind. The intestines are often glued together in different parts by the inter-

* American Journal of Med. Science, &c. April, 1829.

vention of false membranous matter; sometimes sacs are formed by these membraniform exudations, and the intestines, containing purulent matter or other fluids of various appearances. Occasionally the intestines are found agglutinated into one mass, "and partly covered with thickened and adherent omentum." (Broussais.)

Thickening of the peritoneum is a very common post mortem phenomenon in this affection. In some instances, this membrane, though thickened and otherwise disorganized, is but little injected or red; in other cases, it is found reddish and highly injected. Very frequently the surface of the peritoneum is covered with innumerable small white granulations of a *tubercular* character.* Bayle states, that in a subject he examined, where these tubercular depositions were very abundant, he could easily scrape them off with a scalpel; and where this was done, the peritoneum underneath appeared perfectly sound. In some instances, the peritoneum is considerably thickened by granular depositions between its two layers. (Gasc,† Broussais, Abercrombie,‡ Pemberton.) The mesenteric glands are usually enlarged and indurated.

Treatment.—Chronic peritonitis might, perhaps, be generally removed, if it could be subjected to remediate treatment during its incipient or early period. Such, however, is the obscurity and uncertainty of its early phenomena, that it rarely becomes an object of medical attention until it has proceeded to an extent which renders the most judicious treatment almost invariably abortive. Broussais, indeed, for a considerable time regarded this affection as wholly beyond the reach of remediate management. Subsequent experience, however, convinced him that if proper remedies are applied during the first twenty or thirty days of the disease, it may sometimes be effectually subdued, and he thinks it possible that it may yield even at a much later period of its course. This writer accounts for the great difficulty of curing this form of peritoneal inflammation, by referring it to the impossibility of producing the absorption of the tubercular matter which is so constantly deposited between the layers of the peritoneum, and which therefore keeps up a continued irritation in this membrane. External irritating and depleting applications to the abdomen, constitute our most efficient means for combating this affection. *Leeching* is decidedly indicated, and often, no doubt, contributes considerably to the removal of

* "It is always difficult, and frequently impossible," says Dr. Armstrong, "to predicate that tubercles exist on the serous membrane of the abdomen. But when the skin assumes a delicate hue—when the conjunctiva is blanched—when the expression of the face is more softened and pensive than natural, and especially when the patient has any cough, a presumption of their existence might be excited."

† Dictionnaire des Sciences Médicales, vol. xl.

‡ Edinburgh Medical and Surgical Journal, No. lxiii.

the disease, where disorganization or effusion has not yet occurred. After local depletion, a large blister should be applied over the abdomen, and kept discharging by dressing it with mercurial ointment. From several instances which have lately come under my notice, I am inclined to regard pustulation, by means of tartar-emetic ointment, more efficacious than blistering. We may also use stimulating frictions, followed by emollient applications to the abdomen, with a prospect of advantage; more especially where the general system is in too irritable a state to admit the more irritating applications just mentioned. The application of *moxa* to the abdomen has never, I believe, been recommended in the treatment of this affection. From its known powerful influence in subduing deep-seated inflammations, it is not improbable that considerable and prompt benefit might be derived from this application in the present affection. The warm bath has also been recommended as a useful auxiliary in the treatment of this disease. Within the last few years, frictions with mercurial ointment have been used with success in this affection, by Velpeau and Laennec; and from the accounts which they have published, this remedy would seem to be entitled to very great consideration. The latter writer has reported seven cases of *chronic* and *subacute* peritonitis which yielded to mercurial frictions. Two drachms of the ointment should be rubbed in every two hours, until the gums become slightly affected. Since the publication of the first edition of this work, I have witnessed the good effects of this practice in a well marked case of this variety of peritonitis. The disease had continued several months before I prescribed for the patient. The abdomen was enlarged, very tense, and extremely tender to the touch. A course of mercurial frictions over the abdomen, together with one of the following pills* at night, had the effect of gradually subduing the disease; and restoring the patient's health. *Diuretics* also are strongly recommended in the treatment of this disease, but they can be regarded only as auxiliary to the more direct and efficient applications already mentioned. Broussais advises the use of diuretic articles in the way of frictions on the abdomen. The tincture of cantharides, or of squills, may answer for this purpose. If any advantage is to be derived from this class of remedies, however, it will probably be better to exhibit them by the mouth, whilst other more efficacious applications are made to the abdomen. Dr. James Johnson recommends the following combination as a particularly powerful and useful diuretic, in the present, as well as in other affections:

* R. Massce. Hydrarg. gr. xxx.
G. Aloes gr. x.
Tart. Antimonii gr. i.
M.—Divide into ten pills.

℞. Acidi tartarici ℈i.
Sodæ carbon. gr. xxiv.
Infus. digitalis fl. ℥ss.
Spir. ætheris nitrici fl. ℥i.
Tinct. scillæ M. iv.
Aq. menthæ ℥ii. M. ft. This dose to be taken twice or thrice daily.

Mild laxatives must from time to time be used, so as to obviate costiveness and consequent irritation from this source. Castor oil, or the acetate of potash, and cremor tartar, will commonly answer well for this purpose. Although *active* purgatives are not among the means generally recommended in this disease, I have in a few instances known decided benefit to result from the employment of the following mixture :

℞. Crem. tartar. ℥iss.
Pulv. scillæ ℈i.
Pulv. sulphat. potass. ℥ii.
Tart. antimonii gr. ii. M. ft. S. Take ℥ss. three or four times daily.

This combination produces copious watery discharges from the bowels, and stimulates the kidneys to increased action.

To allay the general irritation which is apt to occur in this disease, we may give small doses of Dover's powder, or full doses of extract of hyoscyamus, or of conium maculatum. From the diaphoretic tendency of the first of these articles, it deserves, I think, a preference in this affection. It is of great importance in the management of this disease, to restrict the patient to the weakest and mildest articles of nourishment. Dr. Johnson observes, in reference to the possibility of procuring the absorption of the tubercular matter deposited in the peritoneum in this disease: "There can be little doubt that the absorbents might be made to act upon many extraneous and morbid growths in the human body, by *rigid abstinence* alone, if patients had fortitude to persevere in the measure. For our own parts, we should place more confidence in this than in any other remedy; and practitioners should at all times bear in mind, that without strict abstemiousness, there is little hope of a cure in chronic peritonitis." —(Med. Chir. Rev. Sept. 1820.)—May we not expect some advantage from *iodine*, in the form of frictions on the abdomen, in this affection? It appears to me worthy of trial.

Sect. X.—*Of Acute Hepatitis.*

Although not a very frequent disease in the temperate and colder latitudes, *hepatitis* is one of the most common maladies engendered by the influence of an intertropical or hot climate. The acute form of this disease often makes its attack suddenly,

and with great vehemence, particularly in those parts where it prevails endemically; as along the sandy coast of Coromandel, and the marshy districts of Bengal. When the invasion occurs thus suddenly and violently, the patient is seized, without scarcely any previous symptoms of indisposition, with pain in the right hypochondrium, accompanied with a sensation of tightness across the abdomen; difficult respiration; and an inability to continue in the recumbent position; the patient feeling easiest when in a sitting posture with the body inclined forwards. This mode of attack is frequently observed in the intertropical regions. In the more temperate latitudes it usually comes on in a more gradual, and less impetuous manner; the patient at first complaining only of a feeling of tightness in the right hypochondrium and epigastric regions, with slight incipient febrile symptoms, for a considerable time before the true character of the disease becomes obvious. The pain attending acute inflammation of the liver, is apt to extend itself to parts remote from the liver, more especially to the breast, and to the *clavicle* and *shoulder of the right, and sometimes the left side.* Mr. Annesley observes, that when the internal structure of the liver is the seat of the inflammation, the pain is generally heavy and aching; but when the surfaces or the ligaments become affected, it is usually acute, tensive, and pungent. In some instances these sympathetic pains are even more severe than those experienced in the liver itself. Pressure on the right hypochondrium always greatly aggravates the pain in that part; and a similar effect is almost invariably produced by an attempt to lie on the *left* side; although in some instances the reverse obtains, the patient feeling *most ease* when recumbent on the left side. A dry and troublesome cough, with more or less difficulty of breathing, are common attendants on this disease. When these symptoms are connected with considerable pain in the thorax, the disease may be readily mistaken for pneumonia. Nausea and bilious vomiting frequently occur in acute hepatitis, and in general, the severer these symptoms are, the less cough and difficulty of respiration will be experienced by the patient. In many instances, there is a distressing "feeling of anxiety at the epigastrium and præcordia, accompanied with frequent sighing, particularly when pressure is made simultaneously on the right hypochondrium, and under the right shoulder-blade." A more or less jaundiced hue of the white of the eyes, and skin about the breast, face, and neck, is one of the most constant phenomena of this disease—(Louis.)* The urine, also, is invariably highly imbued with bile, exhibiting a deep yellowish brown colour.

* Mr. Annesley states, that jaundice is not a frequent concomitant of hepatitis in India, unless the ducts or gall-bladder become involved in the disease, or when it supervenes to biliary calculi, or other obstructions of the ducts.

The thirst is usually very urgent, and the skin hot and dry. The pulse is generally full, active, and firm; but in some instances it is small, tense, and quick; and this is said to be the case when the concave surface of the liver is the seat of the inflammation, and the peritoneal surface of the stomach or colon participates in the inflammation. The tongue is coated with a white or thick yellowish fur, and the taste is often bitter; or, "it is smooth and glossy, marked by fissures, and lobulated." (Annesley.)

In general, the bowels are costive; yet, in many instances of the disease in hot climates, diarrhœa attends from the beginning of the malady. (Chisholm.) Cases of this kind often commence like dysentery. The patient is seized with violent griping, followed soon by small watery or slimy discharges from the bowels, accompanied with soreness at the pit of the stomach, or of the right side. If pressure is made on the right hypochondrium, the patient shrinks from the touch, yet the pain in this part is seldom violent. "The degree of violence of the bowel affection," says Dr. Johnson, "will very generally indicate the degree of rapidity and danger of the hepatic inflammation. A scalding sensation in making urine almost always occurs; and the brain often sympathizes strongly with the liver in this affection, giving rise to more or less mental disturbance."

Acute hepatitis rarely continues beyond the sixth or seventh day, without tending either to resolution or suppuration. When the latter has taken place, the pain becomes moderated; the patient experiences a sense of weight and throbbing in the region of the liver, with irregular rigors; more or less profuse night sweats; a sense of sinking, with anxiety and oppression in the præcordia; a clammy skin; and a sense of formication. In some cases, "nearly the whole of the right lobe becomes one enormous abscess." Sometimes adhesions take place between the parts surrounding the hepatic abscess and the internal surface of the abdomen; and when this occurs, and the abscess points outwards, the pus may be discharged by puncture or incision, and the patient often cured. When the abscess is about pointing externally, the general fulness, distention, and pain in the region of the liver and epigastrium, which occurs before the suppurative process commences, are at first somewhat increased; but as the suppuration goes on, and the matter proceeds outwardly, a soft and more or less circumscribed tumour makes its appearance, whilst the general fulness and tenderness in the right hypochondrium in a great measure subside. "When the abscess advances beneath the false ribs, or near the epigastric region, it is generally sufficiently perceptible; but when it points higher up, or more posteriorly, so as to come beneath the ribs, then a bulging out of the hypochondrium is merely marked with fulness of the intercostal spaces, and pain and soreness

limited almost entirely to one spot. In the great majority of abscesses, the direction is to the exterior and superior surface of the liver, and hence the communication so frequent with the diaphragm and lungs when they fail in pointing more externally." (Annesley.) Sometimes the liver forms adhesions with the colon, or some other portion of the intestinal canal, and the abscess bursting into them, the pus will be discharged by stool. Dr. Saunders thinks it probable, that the matter formed in the substance of the liver, may sometimes pass into the bowels through the biliary ducts. When adhesions form between the liver and diaphragm, the abscess often bursts into the cavity of the thorax, or into the pulmonary cells, in which latter case it is often copiously brought up by expectoration. Dr. Wilson* observes, that there is perhaps no instance of recovery after this accident; an observation, however, which has been abundantly contradicted by the experience of others. I have seen an instance in which an enormous quantity of thin reddish pus was discharged from an hepatic abscess through the lungs, followed by a perfect recovery of the patient's health. Annesley mentions cases of this kind;† and Schmidtmann‡ relates two instances of a similar character and successful termination.§ Purulent expectoration sometimes attends hepatitis, from the inflammation extending to the mucous membrane of the bronchial tubes, or to the substance of the lungs, without any direct communication between the abscess in the liver and the cavity of the thorax. Cases occur, in which the hepatic abscess bursts into the cavity of the abdomen, and these are almost necessarily fatal. It has been doubted whether an abscess containing *laudable* pus, can be formed in the parenchymatous structure of the liver. Louis states, that by far the greater number of abscesses which occur in the proper substance of the liver do not contain genuine pus, but a fluid less homogeneous, containing small flakes of blood of a darkish gray colour, or like the washings of flesh. In 430 dissections, he found but *five* instances of *purulent* abscess in the substance of the liver, and not one in its coverings. When genuine pus is formed in hepatitis, the abscess probably occurs in the cellular membrane, between the peritoneal covering and the glandular structure of the liver.‖

* On Febrile Diseases.

† Loco Citat.

‡ Summa Observationem Medicarum, vol. ii.

§ Louis asserts, that abscesses in the liver are incurable; for in all his examinations he never found a single instance of cicatrization in the liver. Dr. Johnson remarks, upon this assertion: "that those who have practised in India know that abscesses of the liver will heal occasionally, whether they are opened externally, or make their way into the intestines."—*Med. Chir. Rev. January*, 1827.

‖ Memoire on Abscesses of the Liver. By M. Louis.—*Repertoire Med.* No. ii. 1826.

Gangrene also, though very rarely, occurs in hepatic inflammation. (Bichat.) Annesley seems to doubt, however, whether this mode of termination ever takes place in hepatitis. He states that he never met with an instance of this kind, although his opportunities for observation were very ample.

In some instances, the disease terminates in a softening of the structure of the liver. Annesley sometimes found the surface of this viscus "marked with red, brown, brick-coloured, greenish-brown, and even with almost black spots and streaks, while the internal structure was inflamed, congested with blood, much tumefied, and softer than natural." Abercrombie found the parenchyma of the liver soft, broken down, and nearly of a black colour.*

It is supposed by Dr. Saunders,† that in the acute variety of this disease, the capillaries of the hepatic artery are exclusively implicated in the inflammation; and that in the chronic form, the inflammation exists in the extreme branches of the vena portæ. The same opinion is expressed by professor Puchelt;‡ and Winslow ascribes both varieties to an inflamed state of the vena portæ. There is certainly no good reason why the capillaries of the vena portæ may not become the seat of inflammation; and when we take into consideration the peculiarity of the hepatic circulation, the opinion of Dr. Saunders is not without considerable plausibility.

Diagnosis.—Pain in the right clavicle and shoulder has generally been regarded as one of the most characteristic phenomena of hepatitis. This symptom, however, is much less common than is generally supposed. M. Louis§ doubts whether it is really indicative of hepatic inflammation, and thinks it arises usually from some affection of the lungs or pleura. Upon this subject Mr. Annesley observes: "The pain sometimes complained of at the top of the right shoulder, and so improperly stated as being one of the chief signs of hepatitis, is, when present, certainly characteristic of the disease in the *right* lobe; but unfortunately this symptom is only occasionally present; and the inexperienced practitioner, who has been taught to look to this as a distinctive mark of the disease, infers, when it is not observed, that the liver is sound."‖

Hepatitis may be distinguished from pneumonic inflammation, by the following diagnostic circumstances. In *pleuritis*, the cough and oppression in the chest are much severer than in *he-*

* Pathological and Practical Researches, &c. &c. Edinburgh, 1828.
† On the Liver.
‡ Ueber das venen System, &c. Leipsic, 1815.
§ Repertoire Med. No. ii. 1826.
‖ Researches into the Causes, Nature, and Treatment of the Diseases of India, &c. By James Annesley, Esq.

patitis. In the latter affection, the patient rests easiest when lying on the affected side; in the former, the reverse obtains. In hepatitis, pressure on the right hypochondrium greatly aggravates the pain, whilst pressure on the intercostal spaces produces little or no increase of suffering; in pleuritis, the former does not, but the latter does increase the pain. When the *substance* of the lungs is inflamed, the difficulty of breathing and the pain are aggravated by lying on the sound side, as in hepatitis; but in the former affection, respiration is performed chiefly by the action of the abdominal muscles and the diaphragm; whereas, in the latter, (hepatitis) breathing is effected almost entirely by the action of the intercostal muscles—the chest being sensibly dilated and collapsed by the act of respiration, whilst the abdominal muscles are quiescent. The pneumonic symptoms are always most conspicuous when the convex surface of the liver is inflamed.

The diagnosis between hepatitis and inflammation of the stomach is rarely attended with any difficulty. The latter affection is almost invariably attended with a very contracted and weak pulse, whilst in the former it is generally moderately full and hard. In gastritis, great muscular prostration usually attends from the commencement of the disease, and every thing taken into the stomach is commonly almost immediately rejected; in hepatitis, the strength is at first not much impaired, and although frequent vomiting may occur, it is not so readily excited by ingesta as in gastritis. In the former, pressure on the right hypochondrium—in the latter, pressure of the epigastric region, causes most pain. From the pain produced by the passage of biliary concretions through the gall-ducts, or by spasm of these passages, hepatitis is distinguished by the absence of fever in the former, the pulse rarely rising above 90 beats in a minute, and the heat of the skin being but little or not at all raised above the healthy standard. In spasm, or irritation by biliary concretions of the gall-ducts, the pain often intermits for a time; in hepatitis, it is continuous. In the former affection, the easiest posture is when the body is bent forward on the pelvis; in hepatitis, the patient leans a little to the right side, with the knees slightly drawn up. When the inflammation is confined to the peritoneal covering of the liver, there is always more pain and fever than when the glandular structure of this organ is the seat of the disease. (Abercrombie.)

Causes.—Dr. Saunders and others ascribe the frequent occurrence of hepatitis in hot climates, to the prevalence of a peculiar miasm in these regions. There can, indeed, exist but little doubt, that koino-miasmata often contribute materially to the production of this disease; but their agency is probably rather predisposing than exciting, in relation to this affection. Miasmata,

unquestionably, possess an especial power to derange the biliary functions; and it may be reasonably presumed, that where, from the general prevalence of this cause, in conjunction with high atmospheric heat, the liver is in an habitual state of morbid excitation or functional derangement; every adventitious exciting cause—such as the sudden influence of a cool and damp night air; errors in diet, and consequent gastric derangement; the intemperate use of spirituous liquors, &c. would be peculiarly apt to develop inflammation in the biliary organs. Dr. James Johnson has advanced some novel and very plausible sentiments in relation to the etiology of this disease. He observes, that "between the extreme vessels of the vena portarum in the liver, and those on the surface of the body—in other words, between the biliary secretion and the perspiration, there exists one of the strongest sympathies in the human frame; and that, whatever increases or decreases the action of the cutaneous exhalents, increases or decreases also the secretion of bile in the liver. Knowing, therefore, as we do, how uniformly high atmospheric temperature excites excessive perspiration, we cannot be at a loss to account for the frequency of hepatitis in hot climates. The excessive and continued perspiration occasions a loss of tone in the extreme vessels of the surface; and this loss of tone in the capillaries of the skin, is accompanied by a corresponding loss of tone in the secretory vessels of the liver. As, however, the perspiratory vessels, from their excessive and long-continued action, become debilitated and extremely sensible to the slightest degree of cold, so when the temperature of the atmosphere is suddenly reduced, as is generally the case in hot climates during the night, when the dew falls, the extreme vessels of the surface are instantly struck torpid, which, in consequence of the sympathy just mentioned, is immediately followed by a similar torpor of the secretory vessels of the liver. The perspiration and biliary secretion being, therefore, thus simultaneously arrested, and the passage of the blood through the liver obstructed, a commotion is raised, which, as there already exists a congestion in the portal circle, falls mainly upon that system, and gives rise to inflammation." That there exists a strong sympathy between the liver and the skin, is strikingly illustrated by the fact, that in chronic hepatic inflammation, or in torpor, or scirrhus of this organ, the skin is always dry and harsh—it being nearly impossible in these affections to excite a perceptible general exhalation from the surface.

It appears to me, nevertheless, that the influence of malaria is too much overlooked in this sympathetic doctrine. High and continued atmospheric heat is so universally attended with the extrication of miasmata, that it would seem extremely difficult to say how much of the previous hepatic excitation, and consequent

atony, is to be ascribed to the one or the other of these causes. That a very considerable share of the effect in question is to be placed to the account of malaria, seems to be demonstrated by the fact, that bilious and hepatic affections are far from being common on board of ships cruising in tropical seas, and where the materials for the extrication of miasmatic exhalations are absent, although the influence of atmospheric heat is constant and great.

Besides the exciting causes just mentioned, there are many others of a less general character, capable of giving rise to this affection. Violent and fatiguing exercise; contusions of the right hypochondrium; metastasis of gout* and rheumatism; wounds and injuries of the cranium;† atmospheric vicissitudes; a draught of cold water while the body is in a state of free perspiration; irritation from biliary concretions in the gall-ducts; suppression of hemorrhoids; violent rage; terror‡ and mental despondency,§ &c. may all give rise to acute inflammation of the liver. Hepatitis may be excited in children by the irritation of dentition.‖

Treatment.—In this disease, as in other inflammatory affections, the abstraction of blood is a primary remedy. There are two reasons for resorting to decisive blood-letting in the commencement of this affection—namely, the necessity of promptly lessening the general momentum of the circulation, as well as the congestion in the liver and portal vessels; and the importance of subduing the general phlogistic condition as early as practicable, in order to favour the effects of mercurial remedies, upon the prompt influence of which much of our reliance must be placed. (Johnson.) As soon as blood has been drawn to an extent sufficient to make a manifest impression on the system, an active mercurial cathartic must be administered. From 15 to 20 grains of calomel, followed in about two hours by a full dose of castor-oil, or of an infusion of senna and manna, consti-

* Quantis implicetur, says Schmidtmann, periculis hepatitis ex podagra retropulsa subnata lugubri illustris Augusti Gottl. Richter, præceptoris mei summe colendi interitu probatur; qui quippe ex podagra hepar petente et inflammante, annum agens septuagesimum, post paucos ab invasione dies occubuit.—*Observ. Medicar.* tom. ii. p. 231.

† Louis doubts this:—The rise, however, of hepatic inflammation and abscesses from this cause, is well established by the testimony of many observers. See the memoirs of M. Bertrandi and M. Andouillé, in the Mémoires de l'Acad. Roy. de Chirurg. tom. iii. p. 439.

‡ Schmidtmann mentions an instance of hepatitis caused by terror; "Jam memoravi me deprehendisse, hepatitidem terrore esse excitatam."—*Summa Obs. Med.* vol. ii. p. 197. Hippocrates speaks of terror as an exciting cause of this affection: De internis adfectionibus. Sect. iii. cap. L.

§ A very striking and interesting case of this kind is related in the Annuaire Medico-Chirurgicale for 1822.

‖ Hufeland's Journal der Pract. Heilkunde, vol. xviii. p. 62.

tutes an appropriate and efficient purgative in this disease. It is often necessary to repeat the bleeding several times in the course of the first few days, before the arterial reaction becomes permanently moderated; and this is particularly apt to be the case in the disease as it occurs in temperate latitudes. In warm climates, a frequent repetition of venesection is not often necessary or even proper—one or two efficient bleedings in the commencement of the disease being in general sufficient to bring down the febrile reaction.

The application of leeches to the epigastric and hypochondriac regions, will often contribute very materially to the reduction of the hepatic inflammation; but one or two efficient bleedings from the arm should be premised to the local abstraction of blood. It may be necessary to re-apply the leeches, where, after the adoption of the measure just indicated, the pulse still retains some activity, and the local symptoms are not considerably relieved.

The bowels should be kept in a loose state throughout the whole course of the disease; and *calomel* must always constitute a principal ingredient in the purgatives employed. From eight to twelve grains of this preparation may be given at first, every six hours, and followed by the exhibition of a small dose of Epsom or Glauber's salts; or of castor-oil, or infusion of senna and manna, if after ten or twelve hours the calomel do not procure free evacuations. After the general arterial reaction has been moderated by direct and local depletion, and the bowels well evacuated, our principal dependence should be placed on the speedy induction of moderate ptyalism, in conjunction with blisters applied over the region of the liver, and moderate purgation. The practice of giving *opium* with calomel in this affection, particularly after the violence of the phlogistic excitement has been broken down by venesection, was long ago recommended as decidedly beneficial by Dr. Robert Hamilton; and it has since his time received the warm sanction of many of the most eminent practitioners. "I know from pretty ample experience," says Dr. Johnson, "that in conjunction with antimonial powder, opium forms a most admirable auxiliary to mercury in acute hepatitis; not only soothing many uneasy sensations of the patient, but determining to the surface and promoting a diaphoresis, which is of infinite service in this, as in most other affections."* Dr. Armstrong also expresses his confidence in the usefulness of this narcotic in hepatitis; and in my own practice, I have had unequivocal evidence of its beneficial effects in this malady. From three to four grains of calomel, with a grain of opium, may be given every four or five hours, and continued

* The Influence of Tropical Climates, &c. vol. i.

until the gums are obviously affected. The addition of two or three grains of the *pulvis antimonialis*, to each dose of the calomel and opium, will do good not only by its diaphoretic powers, but also, as it would seem, by its tendency to favour the induction of the *mercurial* influence; and our main object must be to bring the system under this influence as early as possible.

Whilst these articles are given, it will generally be necessary to exhibit an occasional dose of castor-oil, or one of the saline purgatives. In the more violent and rapid cases of this disease in hot climates, it is often very difficult to obtain the timely operation of mercury on the system, merely from its internal exhibition. Where there is reason to apprehend difficulty in this respect, mercurial frictions should be used in addition to the internal employment of calomel. One or two drachms of the ung. hydrarg. may be rubbed in on the arms or thighs three or four times daily, where ptyalism appears to be tardy in its appearance. Dr. Johnson states, "that the absorption of mercury into the system, and the consequent early induction of general mercurial action, is accelerated by causing the patient to swallow a considerable quantity of warm diluting drink, as thin water-gruel, every night at bed-time."

The application of blisters large enough to extend over the whole right hypochondriac and epigastric regions, is a highly useful measure, after bleeding has been efficiently practised. They almost always give considerable relief to the local pain, and by creating a permanent determination to the external surface immediately over the inflamed liver, they tend in no small degree to subdue the local affection.

As auxiliaries to bleeding, purgatives, and calomel, *antimonials* will in general be useful where the stomach is not too irritable. The *pulvis antimonialis*, in doses of about three grains, may be given either in combination with calomel and opium, or in union with nitre, or the sulphate of potash, every three or four hours; and to promote the diaphoretic operation of these remedies, as well as the specific effects of the mercury, the warm or tepid bath will frequently be found very useful.

When the inflammation has terminated in suppuration, (an event which is announced by the occurrence of rigors, a sense of sinking and anxiety in the præcordia, night sweats, and occasionally formication of the skin, with a fulness and feeling of weight about the margin of the ribs, and a dull throbbing pain in the liver,) the further employment of mercury, with a view to its general influence, is improper. "If the local symptoms and the state of the pulse and of the system seem to require it, the application of a few leeches in the vicinity of the tumefaction will be generally serviceable; and afterwards poultices should be assiduously employed, with a view of promoting the external

pointing of the abscess."—(Annesley.) The bowels also should be regularly though gently evacuated, after the formation of abscess has taken place, which may be best done by five or six grains of calomel, followed, in a few hours, by a small portion of one of the neutral purgative salts. When the abscess does not point externally, nothing more can be done than "to palliate symptoms as they rise, and wait for the event." In instances where the abscess does point outwardly, and the fluctuation of the matter can be distinctly felt, an opening should be made into it, and exit given to its contents. "But this operation ought not, however, to be undertaken precipitately, and before the purulent formation has made its way sufficiently near to the external surface of the organ, or before the part at which it points has formed adhesions to the opposite part of the abdominal parietes. The practitioner should also be fully convinced, from the state of the tumour in the hepatic region, and from the history of the case, that abscess actually exists, and that the tumour does not proceed from an excessive accumulation of bile in the gall-bladder. When the pain and general fulness are diminished, and replaced by a distinct tumour, without acute pain, soft and fluctuating at its apex, or with a soft elasticity and slight lividity or redness of the surface, and a somewhat hardened and elevated base, the operation may be undertaken with every expectation of success."

The operation of paracentesis thoracis has been successfully performed in cases where the abscess had burst into the cavity of the thorax. An interesting case of this kind is related by Mr. Huggins, in the London Med. Repos. for July, 1827.

After suppuration has taken place, and the matter found a favourable exit, there is, perhaps, no remedy which will afford so much advantage as the nitro-muriatic acid. It may be employed both internally and externally as a foot-bath, in the manner recommended by Dr. Scott. Equal parts of the nitric and muriatic acids is the proportion in which they are usually employed. From a half to a whole drachm of this mixture, diluted in a sufficient quantity of water, may be taken daily; and in order to prevent the acid from coming in contact with and injuring the teeth, it should be sucked through a small glass tube, or a quill: or the feet and legs may be immersed from thirty to forty minutes every evening in a warm bath, of the strength, at first, of half an ounce of the acid mixture to a gallon of water, and afterwards gradually increased in strength to the amount of six or eight drachms to the gallon. In two instances of hepatic suppuration from acute inflammation, the patients recovered completely under the protracted use of this bath. Considerable advantage may also be obtained, in suppuration of the liver, from small doses of the muriate of mercury in union with the extract of cicuta, in

the proportion of one-tenth of a grain of the former, to two grains of the latter, three times daily. Mr. Annesley has derived advantage from the nitric acid in combination with laudanum, hyoscyamus, or conium, particularly when the abscess has opened into the lungs. When, in cases of this kind, the system becomes much exhausted, and the night sweats are copious, or where the digestive powers fail, recourse ought to be had to some of the tonic bitters, in conjunction with nitric acid, and the extract of conium.

Sect. XI.—*Chronic Hepatitis.*

Chronic inflammation of the liver, when not the consequence of an acute attack of the disease, begins, generally, with symptoms of functional disorder of the digestive and biliary organs; and in many instances, dyspepsia seems to be the only affection present. The patient complains of irregular appetite, and impaired powers of digestion; acidity; flatulence; slight colic pains; occasional nausea, and vomiting; and a sense of fulness in the region of the stomach. In many instances, a slight dull pain and weight is felt in the right hypochondrium, accompanied, in some cases, with a dragging pain in the right shoulder. Most commonly, however, no distinct pain is experienced in the region of the liver, except when firm pressure is made on this part. In such instances, a sense of uneasiness and tightness is usually felt in the right hypochondrium; and if examination be made, a manifest tumefaction is often discovered in this part. The white of the eyes, and skin of the face, neck, and breast, become tinged with a yellowish hue, and the countenance acquires a contracted and sickly aspect. The bowels are always very irregular, costiveness being most common, alternating in some instances with diarrhœa, the discharges being frequent, scanty, dark-coloured, offensive, slimy, greenish, or watery and muddy. The urine is generally highly tinged with bilious matter, and creates a sense of scalding in the neck of the bladder on being voided.* The tongue is for the most part white, and rather dry; the taste bitter or disagreeable; and in the advanced periods of the disease, the gums often have a peculiar and unnatural firmness. One of the most constant and characteristic symptoms of chronic hepatitis, *is a dry, harsh, and constricted state of the skin*—(Johnson.) So torpid are the cutaneous exhalents in this affection, that almost every effort to produce a general moisture, or even softness of the skin, is abortive. A short dry cough,

* Mr. Rose and Dr. Henry assert, that urea and lithic acid are not found in the urine of persons labouring under hepatitis.

with slight difficulty in breathing, is a frequent attendant on this disease. In the chronic, as in the acute form of this disease, the patient can seldom rest as easy on the left as on the right side. As the disease advances, emaciation becomes more and more conspicuous; slight febrile exacerbations come on towards evening, attended with a burning heat in the palms of the hands and soles of the feet; the nights are restless; and when the inflammation terminates in suppuration, hectic and rapid emaciation consume the vital powers.

When the *convex* surface of the liver is the principal seat of the inflammation, the pain will be referred to the thorax; but when the *concave* surface is the part chiefly affected, the patient generally refers the pain to the stomach or bowels.

Chronic inflammation of the liver often occurs as a consequence of the acute variety of the disease; but it more frequently arises from the slow operation of the same causes which excite acute hepatitis. From the great frequency of chronic affections of the liver in warm and miasmatic situations, there can exist but little doubt, that the slow and continued operation of marsh miasmata is a principal cause of this affection. That this miasm has a particular tendency to produce biliary derangement, seems evident from the sallow and jaundiced appearance of those who reside in marshy districts. The liver being in a state of almost constant excitation in situations of this kind, and finally disordered in its functions, is especially predisposed to become the seat of congestion and slow inflammation, on the supervention of any other cause capable of deranging the cutaneous or digestive functions.

Post mortem appearances.—Chronic inflammation may terminate variously. No recent traces of inflammation are detected in the liver on post mortem examination. The viscus usually exhibits an ash or clay colour, and is generally somewhat changed in its healthy, or natural shape. Dr. Saunders observes, that the lower margin of the left lobe, which in the healthy liver is thin, is commonly found rounded and gibbous in chronic hepatitis. In some instances the liver is of a much more firm and solid consistence than natural, although its weight is often specifically lighter than the healthy organ. In some cases, particularly in hot climates, the liver suffers much greater organic destruction than mere change of consistence and colour. Dr. Lind found the liver, in persons who had died of this disease, so eaten through as to resemble a honey-comb. Suppuration is a common termination of chronic hepatic inflammation in India. "Not unfrequently, very minute abscesses are scattered through the substance of the liver, both with and without the appearance of a distinct cyst, the matter collected being of a firm or cheesy consistence, and yellowish white colour."—(Annesley.) Sometimes, however, one large abscess is found in the structure of the liver.

Tubercles, of various sizes and appearances, are occasionally found imbedded on the surface, and interspersed through the substance of the liver. These morbid depositions vary in consistence "from a gristly or cartilaginous state, to one of semi-fluidity;" the firmer ones when divided often presenting either a concentric or radiated texture. In the most chronic cases, the substance of the liver acquires almost a cartilaginous consistence. Annesley states, that in those who had been addicted to the use of spirituous liquors, the substance of the liver, besides small tubercles, exhibited "a cheesy consistence and texture of a deep nankeen-like colour." Occasionally the liver is firm, and much diminished in size, and its internal structure has sometimes exhibited a parboiled, scabrous, dry, and spongy appearance.*

Treatment.—General depletion is very rarely indicated in this variety of hepatic inflammation. In cases of a subacute character, more especially when they occur as the consequence of an acute attack of the disease, it will sometimes be useful to abstract small portions of blood; but even in instances of this kind it will be better to deplete by *leeches* applied to the epigastrium. "In the chronic hepatitis of India," says Annesley, "there are few cases where repeated though moderate leeching will not be advantageous." After each leeching, an emollient poultice should be applied over the right hypochondrium, and a mercurial aperient administered at night. When the phlogistic action of the liver has been reduced, (where such reduction may be indicated by the local pain, and action of the heart and arteries,) by moderate depletory and aperient measures, recourse should be had to a more regular administration of mercurial remedies. In the employment of mercury in this affection, however, it must be managed so as not to produce active ptyalism. Full salivation seldom proves beneficial, and may do injury in this form of the disease. A moderate, uniform, and prolonged mercurial influence will generally procure all the advantage that this remedy is capable of affording. From three to four grains of blue pill, in combination with a grain of the extract of conium, or of hyoscyamus, should be given three times daily, until the gums become slightly affected.† The medicine is then to be discontinued until the soreness of the gums is going off, when it is to be resumed, and given once or twice daily, so as to keep up a uniform impression on the system without producing ptyalism.

* Researches into the Causes and Treatment of the Diseases of Warm Climates. By James Annesley, Esq. p. 470.

† I have been in the habit of uniting small portions of ipecacuanha to the blue pill and conium, in this and other chronic complaints. Thus:

℞. Massæ hydrarg. ʒi.
Extract. conii maculat. ʒss.
Pulv. ipecac. ℈i. M. Divide into 30 pills.

S. Take two every morning, noon, and evening.

During this mercurial course, mild laxatives should from time to time be given, so as to keep up a regular action of the bowels. For this purpose, small doses of Glauber's or Epsom salts, or of powdered rhubarb, may be given every second or third day, according to the state of the bowels. Mr. Annesley recommends the following aperient pill in this affection:

℞. Hydr. submuriatis ℈i.
Extract. colocynth. comp. ℈ii.
Antim. tart. gr. i.
Pulv. ipecac. gr. iv.
Sapon. castil. gr. x.
Ol. carui q. s. M. ft. pilul. xviii. S. Two of these pills may be taken every night on going to bed. In most cases one pill will be sufficient.

To preserve the tone of the stomach, as well as the regular action of the bowels, it will be useful to prescribe a weak infusion of some of the tonic bitters—as gentian, colomba, and quassia. A table-spoonful of an infusion of this kind, with ten or twelve drops of *nitric acid*, may be taken morning, noon, and evening.

Dr. Johnson recommends the following formula as an excellent tonic in this affection:

℞. Decoct. taraxac. ℥iv.
Carbonat. sodæ ʒi.
Extract. taraxac. ʒii.
Tinct. gentian ʒii. Misce. S. Take two or three table-spoonfuls twice daily.

"The more the taraxacum is employed," he says, "the more certain proofs will it afford of its utility." The aperient and diuretic qualities of this root are unquestionable.*

In speaking only of a moderate mercurial action, I refer particularly to this affection, as it is usually met with in the *temperate* latitudes. In the intertropical regions, chronic hepatitis is generally much more rapid in its progress, and is much more apt to terminate in abscess than in the colder climates. In consequence of this it is often necessary to employ the mercury more freely, and to carry it to the extent of producing salivation. Chisholm and Johnson recommend the production of moderate ptyalism, and there can be no question of the general propriety of this practice in hot climates.

The nitro-muriatic acid bath was some years ago strongly recommended to the profession, as a remedy in this variety of hepatitis, by Dr. Scott, and it has since received the approbation of many other practitioners, whose opportunities for testing its virtues in this way were very ample. "As a general rule," says Dr. Scott, "it may be observed, that whenever the mercurial preparations are indicated, the nitro-muriatic acid will be

* Med. Chir. Rev. Jan. 1829.

found useful—with this difference, that in cases where mercury is highly injurious, from delicacy or peculiarity of constitution, or from other causes, the nitro-muriatic acid may be employed with safety and advantage." Dr. Johnson, who speaks very favourably of this remedy in chronic hepatitis, gives the following directions for using it. "Into a glass vessel capable of holding a pint or more of fluid, put eight ounces of water; and then pour in four ounces of nitric, and the same quantity of muriatic acid. One ounce of this mixture to a gallon of water will form a bath of a medium strength. The feet and legs of the patient are to be immersed in this bath at the temperature of about 96°, and kept there twenty minutes, or half an hour, just before going to bed. This should be done every night, and the same bath will remain good for five or six nights." If no pricking or itching sensation is felt in the feet and legs after they have been immersed for twenty or thirty minutes, more of the acid must be added to the bath. The nitro-muriatic solution may also be used with benefit in the form of a wash. Two or three drachms of the above mixture should be added to a pint of warm water, and the body and thighs sponged with it, night and morning, for fifteen or twenty minutes at a time. Mr. Annesley states, that "he found great advantage from employing this solution in the form of a poultice in torpor of the liver, and in chronic affections of the organ attended with enlargement, and a deficient and morbid state of the biliary secretion." Mr. Annesley speaks in the most favourable terms of this remedy in chronic affections of the liver. Where the structure of this organ is enlarged, and the biliary and intestinal secretions disordered, he declares this mixed acid, "one of the most valuable remedies we possess." I have frequently used it in affections of this kind, and generally with marked advantage.

The internal use of the *nitrous acid* also has been found very beneficial in this affection. From two to four drachms diluted in a large portion of some mucilaginous fluid, may be taken in the course of twenty-four hours. It seldom fails to induce more or less ptyalism, when its employment is continued for some time; but it often acts beneficially without the production of salivation. It may be given simultaneously with mercury. (Annesley.) Sir James M'Grigor, indeed, thinks that peculiar advantages result from the conjoined use of these remedies.

Blisters are beneficial in chronic hepatitis; but I have generally seen more advantage derived from pustulation of the right hypochondrium by frictions with tartar emetic ointment. The *white precipitate* ointment forms a most excellent counter-irritating application in this affection. Two drachms of white precipitate, rubbed up with an ounce of lard, and applied two or three times daily by frictions to the region of the liver, will

seldom fail to bring out a copious crop of large suppurating pustules, more permanent than those which are produced by *tartar emetic*, and much less painful and irritating. A seton in the right hypochondrium has been found very useful in the more chronic instances of this affection.

The diet should be light, unirritating, and digestible ; and the patient must especially avoid a cold and damp atmosphere, or the influence of sudden changes of atmospheric temperature. In general, persons who are affected with this disease are peculiarly sensitive to low temperature ; and it is a matter of considerable consequence to the successful issue of our remediate efforts, to place such patients in a temperature perfectly agreeable to their sensations and uniform in its grade.

Sect. XII.—*Of Splenitis.*

The physiological relations of the spleen are as yet but very imperfectly understood ; nor have the diseases to which it is subject, been "either carefully studied or clearly revealed." "Our ignorance of its use during health, has rendered us less alive to its conditions in disease ; and the obscurity of its functions when natural, has made their study when disordered less interesting in its object, and less successful in its issue." It does not appear that this viscus is often the seat of *active* or acute inflammation, although *chronic* inflammation is probably much more common than is generally suspected.* When *acutely* inflamed, the patient commonly feels a heavy pain under the false ribs of the left side, which is considerably increased by external pressure. The left hypochondrium is said to become fuller than natural, and in some instances, considerable pain is felt under the right scapula. The skin and eyes become slightly jaundiced, and the urine highly tinged with bilious matter. A burning and oppressive sensation in the stomach, with nausea and vertigo, particularly when the patient raises himself in bed, and other dyspeptic symptoms, frequently attend the affection.†

In *chronic* splenitis, slight uneasy and occasionally painful sensations are from time to time experienced by the patient ; and there is difficulty in lying on the left side, accompanied with dyspeptic symptoms, a cachectic aspect of the countenance, and a gloomy, morose, desponding, or variable and fretful temper. Persons affected with chronic inflammation of the spleen, are said to be prone to attacks of vomiting of blood—(Marcus, Richter,) —more especially when the inflammation has terminated in in-

* Richter thinks that *chronic splenitis* is even more common than chronic hepatitis.—*Die Specielle Therapie*, band. i. s. 576.

† Marcus, Vide Annalen der Medizin, band. vii. s. 327.

duration of this viscus. The blood, perhaps, passes into the stomach through the *vasa brevia*.

From the foregoing symptoms, it is manifest that the diagnosis between this affection and *hepatitis* must always be attended with considerable uncertainty. The pain in the *left* side, and the vertigo when the head is raised, or on sitting up, are the only symptoms mentioned that are not as common in the latter as in the former affection.

Inflammation of the spleen may terminate in suppuration, softening of its structure, (*ramollissement*,) hypertrophy, and induration.

Suppuration, however, occurs but very rarely in this affection. M. Jaquinelle relates an instance in which a large abscess in the spleen had burst into the colon; and Wardrop found nearly the whole structure of this viscus converted into an abscess containing a purulent fluid.

Softening of the structure of this organ is a very common occurrence, particularly "after some forms of general disease." In fatal cases of typhus, ramollissement of the spleen is almost always present.* This softening consists of "a broken down semi-fluid pulp, resembling black currant jelly." (Abercrombie.)

Enlargement of the spleen is particularly apt to occur in remittents and intermittents. It is probable, however, that this condition is rarely the consequence of *inflammation*,—being the result, generally, of great and protracted sanguineous congestion of this organ. During the cold stage of intermittents, the spleen always becomes greatly engorged with blood, and when this disease continues a long time, enlargement, induration, and sometimes a complete disorganization of this organ takes place. Dr. Vetch states, that in the only three cases of intermitting fever which he has known to terminate fatally during the cold stage, the spleen was found so much distended with blood, and its structure so much altered, that it resembled a mass of dark uncoagulated blood, which was broken down by slight pressure of the finger. This state of the spleen is attended with great increase of its vascularity; whilst little or no morbid change usually occurs in its proper substance. Dr. Aber-

* Dr. Vetch, physician to the Charter-house, mentions the following symptoms as generally accompanying *enlargement* of the spleen. There is little or no pain complained of by the patient; "the appetite is usually good, yet the powers of assimilation are obviously deficient; the patient loses flesh; is incapable of any muscular exertion; his features have a dark, bilious, or mahogany hue, but the conjunctiva preserves a white and healthy appearance; perspiration is in time wholly suspended, and the skin acquires the appearance and feel of satin; the lips are pale, and there is generally much wasting of the gums; the urine is limpid, and secreted very rapidly, but contains little or no urea. The patient's mind is desponding and morose; and there is coldness of the lower extremities." —*Med. and Phys. Journal*, 1824.

crombie observes, that "one of the most singular facts in the pathology of the spleen, is the very rapid manner in which enlargement of it takes place; and the equally rapid manner in which it subsides."*

In some instances, *tubercles* and *hydatids* are found in the spleen; and authors mention a *pale induration* of this organ as an occasional phenomenon. (Diemerbroeck.) Dr. Abercrombie mentions also, infiltration of a gelatinous fluid, and deposition of adipose matter into the substance of the spleen.

Treatment.—Acute inflammation of the spleen, is to be encountered with the usual antiphlogistic remedies proper in visceral inflammations. Decisive blood-letting, purgatives, and counter-irritating applications to the region of the spleen, constitute the principal means for combating this affection. The warm bath, after the active state of the disease has been in some degree reduced, is said to be a useful auxiliary.

In the *chronic* form of the disease, leeching and pustulation of the left hypochondrium by frictions with tartar emetic ointment; the warm bath; mercurial laxatives; a seton in the left side; alterative doses of blue pill with extract of hyoscyamus; diaphoretics; and the protracted use of minute doses of tartar emetic, are the remedies upon which our chief dependence is to be placed.

In enlargement and induration of the spleen, particularly when it occurs as the sequel of intermitting fever, I have found no remedy more useful than large doses of the muriate of ammonia. The formula given in the chapter on intermitting fever may be employed with a pretty certain prospect of success in cases of this kind. Small doses of tartar emetic also, are decidedly beneficial in enlargement of the spleen. One grain dissolved in two quarts of some bland fluid or water, may be taken in place of the common drink, and continued for eight or ten days. Alterative doses of blue pill with ipecacuanha, in the proportion of two grains of the former to one of the latter, will frequently succeed in removing this state of the spleen. The bowels must be regularly moved by some mild aperient; and the diet should be mild, digestible, and nourishing. The warm bath, and frictions with dry flannel or the flesh-brush, will assist in the removal of this affection.

Iodine, has recently been employed for the reduction of enlargement and induration of the spleen; and it would appear to possess very active powers against this affection. It may be used either internally in the form of tincture, in doses of from 8 to 10 drops three times daily; or in frictions with the hydriodate ointment, over the region of the spleen.

* Med. Chir. Rev. January, 1829.

CHAPTER X.

OF THE PHLEGMASIÆ OF THE NERVOUS SYSTEM.

The pathology of encephalic inflammation is attended with much difficulty on account of the variety of structures which compose the encephalon, and the consequent diversity which occurs in the symptoms and terminations of its inflammatory affections. Within the cranium there are no less than three distinct structures, namely, the fibrous, the serous, and the cerebral, and there is reason to presume, that the phenomena of cephalitis will be considerably modified, according as one or the other of these structures is the principal seat of the inflammation. It is not probable, however, that any one of the structures within the cranium can suffer inflammation, without involving, in some degree, the others; and all attempts, therefore, to assign to each structure its peculiar symptoms under inflammation, must necessarily be attended with considerable uncertainty. Nevertheless, there are certain modifications of the phenomena of cephalitis, which observation has taught us to refer to particular structures, and which may, therefore, be taken as a basis for the division of encephalic inflammation into certain varieties, sufficiently distinct to demand separate consideration.

Agreeably to these circumstances, cephalitis presents us with the following varieties, viz:

Meningitis and *cerebritis.*—Meningitis must be again divided into inflammation of the *pia mater*, with more or less inflammatory action in the rest of the membranes and the brain; and *arachnitis.*—The first of these subdivisions constitutes the affection commonly called phrensy (phrenitis;) and the last is known under the inappropriate name of *hydrocephalus.*

Sect. I.—*Phrenitis*, (*Phrensy.*)

Phrenitis generally begins with pain and a sense of fulness in the head, attended, in most instances, from the commencement, with considerable nausea and vomiting. As the pain and febrile reaction increase, the eyes become red and sparkling; the face flushed; and the patient often experiences a peculiar sensation of uneasiness along the course of the spine. Delirium is commonly an early attendant on the disease, and in most instances, soon acquires a degree of violence resembling the most furious and ungovernable mania. In this aggravated state of the disease,

the face becomes turgid; the eyes wild and furious; the carotids beat strongly; vision is imperfect and deceptive; and the whole system is in a continued state of restlessness or agitation. During the early part of the disease, the sense of hearing is generally painfully acute, but in its advanced periods, complete deafness often occurs. At first, the pulse, along with its firmness and activity, has considerable volume; but in the progress it becomes *small* and tense, and not unfrequently intermitting. Respiration, though hurried and anxious at first, becomes slow, deep, and somewhat laborious in the latter stage of violent instances of the disease; and in many cases deglutition is performed with much difficulty.

The liver often sympathizes strongly with the brain in this disease, giving rise to a copious secretion of bile, jaundice, and other manifestations of hepatic derangement. Dr. Wilson observes, "that there is often a remarkable tendency to the worst species of hæmorrhages from the bowels, towards the termination of fatal cases," an observation which was confirmed by a remarkable instance which came under my own notice. On the day preceding the fatal termination of this case, an exceedingly copious discharge of dissolved blood took place from the bowels, and on the following morning the hæmorrhage occurred also from the mouth and gums.

Causes.—Phrenitis is not often an idiopathic affection. It occurs most commonly during the progress of general fevers, particularly synocha, and the aggravated instances of typhus. The ordinary exciting causes of this variety of encephalic inflammation are, violent passions; insolation; the sudden influence of cold while the body is in a state of free perspiration; drunkenness; suppression of habitual sanguineous discharges; and particularly metastasis of gout, erysipelas, and parotitis, and the extension of other external inflammations about the head to the brain, an occurrence sometimes met with in small-pox. I have known the disease to supervene in consequence of a large phlegmonous swelling under the left ear; and another instance, from a similar inflammation on the back of the neck.

Prognosis.—Hæmorrhages, in the advanced period of the disease, particularly from the bowels, may be regarded as almost a certainly fatal sign. Bleeding from the nose, however, at an early period, seldom fails to mitigate the violence of the disease, and should always be promoted as a most favourable occurrence. Coma supervening on violent delirium, is indicative of great danger; for after the occurrence of this symptom, little or no hopes of recovery can be entertained.

Phrenitis is always attended with considerable danger; and the unfavourableness of the prognosis, must of course be proportionate to the violence of the symptoms, and the obstinacy with

which they resist remediate treatment. Morgagni observes, that when phrenitis supervenes on peripneumony, the worst consequences are to be apprehended; and the same observation is made by Schmidtmann.*

Pathology.—It is stated above, that in the disease just described, the inflammation is principally located in the *pia* and *dura mater;* and this appears to be entirely confirmed by the phenomena which are presented on post mortem examination. I am aware, that Bichat asserts that the *dura mater* is scarcely susceptible of inflammation;† but this assertion is contradicted by others, and with justice. Shaw, in his Manual of Anatomy, states, that after phrenitis, the traces of inflammation are always very conspicuous on the surface of the dura mater, "which is generally as much blood-shot, as the conjunctiva in ophthalmia, with layers of lymph occasionally on the inner surface." The observations of Morgagni, also, go to establish the same fact; for in nearly all the dissections which he relates of subjects who had died of this disease, the *pia* and *dura mater* showed the strongest signs of previous inflammation. The substance of the brain itself does not often exhibit unequivocal traces of inflammation in those who die of phrenitis; but in nearly all instances, flakes of coagulable lymph, and often pus mixed with serum, are found between the membranes, and in some cases the dura mater has been found eroded to a considerable extent. (Morgagni.) Indeed, inflammation of the *cerebral* substance alone is very rarely attended with the violent delirium and pain which distinguishes the affection under consideration; nor is delirium a very constant and prominent phenomenon in *arachnoid* inflammation, though frequently connected with very severe and lancinating pains in the head. It cannot, indeed, be doubted, that the brain becomes more or less involved in the inflammation which constitutes this disease, but the principal seat of the inflammation would seem to be placed in the pia and dura mater. Morgagni states, that he has found the membranes alone affected, although, in the majority of cases, traces of inflammation were also discovered in the cerebral structure.

Treatment.—There is no inflammatory affection which more urgently demands a vigorous antiphlogistic treatment, than the present one. Blood-letting, promptly and efficiently used, is a *sine qua non* in the remediate management of this affection, as indeed it is in all the modifications of cephalitis. Many of the other phlegmasial diseases may often be treated successfully without sanguineous depletion. Pneumonia is treated by some,‡

* Summa Observationum Medicarum, vol. i. Berlin, 1819.
† Pathological Anatomy, translated by I. Togno, M. D. page 58.
‡ Schmidtmann, Vogel.

with opium and calomel; and by others,* with tartar emetic, with little or no abstraction of blood. But phrenitis is, perhaps, never treated with success without efficient blood-letting, nor is it likely that any other remediate measures would be of adequate avail, without the aid of this most prompt and efficient of all our antiphlogistic means. Blood should be drawn from a large orifice, and suffered to flow until unequivocal signs of its effects on the action of the heart and arteries are manifested. Carried to the extent of inducing an approach to syncope, bleeding will generally speedily subdue the furious delirium and intense pain in the head. In all inflammatory affections of the head, particular advantage may perhaps be obtained by taking the blood from one of the jugulars or the temporal arteries. Although bleeding is always most serviceable when adequately performed in the onset of inflammatory affections, yet in the present disease, it may be advantageously resorted to throughout the whole course of the malady, if the pulse remains tense and quick. Topical bleeding by leeches or cups, is less beneficial in this, than in the less violent forms of encephalic inflammation in its early stage. After the momentum of the circulation has been diminished by general bleeding, leeches or cups, applied to the temples and about the head, will in general procure considerable advantage. The application of *cold water* or *ice* to the head, is a valuable auxiliary in the treatment of this disease. The hair should be cut short, or shaved off, and bladders partly filled with cold water, into which a lump of ice is put, should be kept constantly applied to the top of the head. Purgatives of the active kind will assist materially in reducing encephalic inflammation.

In all affections of the head, whether congestive or inflammatory, there is usually considerable torpor of the intestinal canal, and it is generally necessary to prescribe large doses of some active purgative to procure an adequate evacuation of the bowels. As the liver usually sympathizes strongly with the brain in its inflammatory affections, calomel forms an appropriate constituent in the purgatives proper in this disease. From ten to twelve grains of this article, followed after the lapse of three or four hours with infusion of senna or a full dose of Epsom or Glauber's salts, will in general answer well as a purgative in this affection. Care must be taken in the use of calomel, lest ptyalism be induced, an occurrence which could hardly fail proving injurious. The bowels should not be suffered to remain inactive for more than five or six hours at a time, and this should be attended to, not only during the active course of the disease, but throughout the period of convalescence. Cathartics do good in this affection, both as revulsive and evacuant means. By excit-

* Rasori, and the advocates of the contra-stimulant doctrine.

ing the intestinal exhalents, and thus directing the circulation more particularly to them, purgatives tend in no inconsiderable degree to diminish the flow of blood to the head, as well as the general momentum of the circulation, by their indirect depletory effects, and the removal of irritating matters from the intestinal canal.

Many writers recommend the application of blisters to the head, after the violence of the febrile excitement has been in some degree subdued by the depletory measures. In the early periods of the disease they are useless, and perhaps injurious, but when the violence of the inflammation is moderated, and the disease, as it were, lingering on the confines of convalescence, advantage may, perhaps, he derived from vesicatories applied to the shaven scalp. It has appeared to me, however, that more benefit is derived in the inflammatory affections of the brain, from blistering the back of the neck, than from vesicatories laid on the top of the head. When applied on the neck, we may at the same time continue the use of cold applications to the scalp, a union of applications particularly appropriate to this disease.

The patient's head should be kept in an elevated position, in order to lessen the impetus of the circulation in the affected parts. In all inflammations, considerable benefit accrues from placing the inflamed part, if feasible, in a raised position, as we thereby favour the return of the blood from the inflamed structure by the veins, and impede, in some degree, the access of the blood by the arteries, in consequence of the additional resistance offered by the gravity of the blood to the propulsive efforts of the heart.

Among the internal antiphlogistic means, *nitre*, in combination with *antimony*, or *digitalis*, may be accounted the most useful. From ten to twelve grains of the nitrate of potash, with half a grain of digitalis, may be given every two hours. Digitalis is particularly well suited to the management of this, as well as of other inflammatory affections, after the violence of the disease has been broken down by the remedies already mentioned, and when it continues its course in a reduced or subacute form. Given in small and frequent doses, it will, under these circumstances, often make a very decided and salutary impression upon the action of the heart and arteries. From a quarter to half a grain of the powdered leaves may be given every two hours, until it either causes a reduction of the frequency and activity of the pulse, or produces nausea or other symptoms of gastric disturbance.

During the whole course of the disease, the chamber of the patient should be kept dark, silent, and cool, and every thing avoided which has a tendency to disturb or excite the system. No nourishment whatever, with the exception of toast-water

and lemonade, or similar beverages, must be allowed, so long as there is pain in the head, and general febrile irritation.

Sect. II.—*Arachnitis.*

Hydrocephalus acutus; acute dropsy in the brain; apoplexia hydrocephalica—(Cullen.) Encephalitis—(Porter.) Phrenicula—(Rush.) Hydencephalus—(Smith.) Cephalitis profunda—(Good.)

Arachnitis is a much more common form of encephalic inflammation than the preceding one.* It has of late years been extensively investigated by Martinet and Duchatelet, of Paris, and by Dr. Abercrombie, of Edinburgh, whose pathological researches in relation to this subject are highly interesting and valuable. I treat of hydrocephalus and arachnitis under the same head, for it is now placed beyond all doubt, that the malady known and described under the name of *hydrocephalus*, consists essentially of arachnoid inflammation. The term hydrocephalus is indeed altogether inappropriate to the disease, for instead of directing the mind to the primary and essential affection, it has reference only to *one* of its ordinary consequences—namely, serous effusion on the surface and within the cavities of the brain. Dr. Rush was one of the first who taught correct views concerning the pathology of this disease. "Having for many years," he says, "been unsuccessful in all cases but two of internal dropsy of the brain which came under my care, I began to entertain doubts of the common theory of this disease, and to suspect that effusion of water should be considered only as the effect of a primary inflammation in the brain." He regarded this disease as a subacute grade of cerebral inflammation, or an inflammation less violent than that which gives rise to the symptoms of phrenitis, and therefore distinguished it by the name of *phrenicula*.† The impropriety of designating this disease by the name of *dropsy*, is often strikingly exemplified by the post mortem phenomena; for in some instances very little or no serum is effused into the ventricles, or upon the surface of the brain, although the symptoms were unequivocally those

* Dr. Coindet states, that in France, 20,000 deaths occur of this disease annually; while Dr. Alison informs us, that 40 out of 120 patients die of this affection in the New-Town Dispensary; and, according to the late Dr. Davis, of London, 8 out of 45 deaths in the Universal Dispensary were produced by hydrocephalus.—*Med. Chir. Rev. March*, 1828; p. 385.

† Dr. Porter contends that hydrocephalus is not phrenitis, (though he admits that meningitis may be superadded,) but an inflammatory condition of the posterior arteries of encephalon, and of the base of the brain.—*Med. Chir. Journ. July*, 1819.

which are acknowledged to characterize hydrocephalus—(Abercrombie.)

It is, nevertheless, probable, that effusion within the cavity of the cranium does sometimes occur without inflammatory action of the vessels of the encephalon, from mere congestion of the cerebral blood-vessels. This is, perhaps, the case in some of the instances which are ushered in by convulsions, or a state of somnolency and stupor, without any manifest previous febrile irritation. Be this as it may, arachnoid inflammation constitutes unequivocally the essential pathological condition of what is generally known under the denomination of hydrocephalus.

Arachnitis occurs most commonly during childhood; and the period of dentition is the age during which the greatest aptitude exists to the disease. That there should be a particular proneness to this malady during the process of dentition is easily to be understood. Whilst this process is going on, there is almost always more or less local irritation in the immediate vicinity of the brain, connected with a general irritable and phlogistic condition of the system—circumstances which, co-operating with the natural predominance of the cerebral circulation in infancy, are well calculated to invite to inflammatory affections of the head during this period of life.

Symptoms.—Arachnitis may be divided in three stages. The first stage may be called the *irritative* period; for, in the commencement of the disease, the symptoms are those of an *irritated*, rather than an inflamed condition of the brain. The approach of the disease is frequently very gradual, more especially during early childhood. In many instances, the brain manifests a very irritable condition for several weeks previous to the full development of the disease. The patient is wakeful; irritable in temper; evincing a repugnance to strong light, on account of the sensible state of the retina; the pupils are contracted; the disposition fretful and variable; small children cry frequently, without any apparent cause, and, when sleeping, often start or awake suddenly, with violent screaming, "and an expression of terror in the countenance." Nurslings, when awake, often "start at the slightest noise, and shriek suddenly as if pricked with a pin."* This state of cerebral irritability sometimes exists and continues for a time without passing into the inflammatory state; the child gradually returning to its ordinary condition of health. When, in this state, some additional exciting circumstances supervene—such as cold, dentition, or intestinal irritation from improper food, or other irritating substances lodged in the bowels,

* Dr. W. Nicholl's Transact. of the Association of Fellows and Licentiates of the King and Queen's College, Dublin, vol. iii. Practical Remarks on disordered states of the Cerebral Structures occurring in Infants. By W. Nicholl, M. D. London, 1821.

this irritative condition of the brain is increased, and, sooner or later, converted into inflammation. A new train of phenomena now ensues, which characterizes the *inflammatory*, or second stage of the disease. The patient complains of transient pains in the head, alternating often with similar pains in the abdomen. The restlessness and irritability of temper increases; the pulse is irritated, quick, tense, and active; the physiognomy expressive of discontent and suffering; one or both cheeks marked with a circumscribed flush; the eyebrows knit and frowning; and the eyelids generally half closed, on account of the sensible state of the retina. The bowels are commonly torpid, and sometimes relaxed, the stools presenting an unnatural appearance. As the disease goes on, the cephalic pains become more and more severe, suffering occasional remissions, and sometimes subsiding entirely for a few minutes. These pains are felt chiefly in the forehead, shooting backwards towards the temples. Children manifest their sufferings from the headach, by frequently applying the hands to the forehead. At this period of the disease, the stomach is usually very irritable—the retching and vomiting becoming often very troublesome, particularly when the patient is raised to a sitting posture. I have met with many instances in which no disposition to vomit was manifested whilst the patient remained in a recumbent position; but the moment the head was raised from the pillow, sickness and vomiting ensued. Indeed, children affected with this disease always bear the erect position with great uneasiness. "In the early part of the disease, the little patient cannot sleep with the head low; he lies in the bed with out-stretched arms, which have a tremulous motion; are often directed towards the head, and firmly clasped upon it; he is constantly turning and tossing from one side of the bed to the other, and very frequently groans much, as if under the influence of pain." (Monro.) The sickness of the stomach sometimes alternates with the cephalic pains.—(Quin, Fothergill.) One of the most common and characteristic symptoms of this complaint is frequent and deep sighing; though this is seldom much noticed until the disease is fully developed, and is generally most remarkable about the period when the inflammation is about terminating in effusion. During the latter part of the inflammatory stage, transient delirium usually occurs; but the delirium of arachnitis is never violent or furious, but of the tranquil kind, and rarely so great that the patient may not be roused from it, so as to give distinct answers. (Martinet.) The skin in this stage is generally above the natural temperature, and dry; the tongue, for the most part, remains clean, or covered only with a thin white fur, with pale red edges. In cases, however, which depend on gastric irritation, it is apt to be covered with thick brown fur, becoming dry and rough towards the termination of

the disease. After an indefinite period, these inflammatory symptoms are succeeded by a new train of phenomena, marking the third stage, or the period of cerebral oppression. The delirium is now more continuous; the countenance exhibits an aspect of surprise and stupor; the pupils are dilated or much contracted; the conjunctiva is suffused and reddish; the eyes turned up under the upper lids during sleep; constant somnolency supervenes, the patient being wholly inattentive to surrounding objects, and when roused, speedily relapses into the same somnolent state. The mind is torpid, and apparently incapable of any attention. The drowsiness increases more and more, until a complete state of coma ensues. In some instances, the coma comes on suddenly in conjunction with paralysis of one side or one extremity; but it more commonly approaches in the gradual manner just described. Indeed, instances occur, in which no febrile excitement is developed, the first manifestations of the disease being an unusual drowsiness or torpor. In this latter case, arachnoid inflammation exists, no doubt, without showing itself by its usual symptoms; for it is well ascertained, that inflammation may go on in the brain, even to the extent of terminating in extensive and fatal disorganization, without causing either pain or any other general symptoms characteristic of inflammation. Soon after the somnolent stage supervenes, paralytic affections generally occur. A tremulous motion of one arm, with the hand firmly contracted inwards, is usually one of the first manifestations of paralysis in infants; and, by degrees, the power of using the arm and leg of one side becomes entirely lost; one or both upper eyelids usually becoming paralysed at the same time, so that the patient, in endeavouring to look at any thing, is unable to raise the lids by their proper muscles, and is, therefore, obliged to draw them up with the integuments of the forehead, by the contraction of the occipito-frontalis muscle.* Previous to the occurrence of paralysis, strabismus almost always occurs, and in many instances, there is double vision. In general, a sudden amendment in nearly all the symptoms takes place soon after the inflammation has terminated in effusion; and parents and friends, nay, even physicians, may be deceived into the hope that the disease is about assuming an unexpected favourable change. This flattering calm is, however, seldom of long continuance, and almost universally ultimately fallacious; for, sooner or later, convulsions suddenly supervene, or the patient relapses into a state of fatal coma and stupor. Convulsions rarely, if ever, remain wholly absent towards the fatal termination of this disease. During the somnolent stage, the pulse is generally slow

* Recherches sur l'Inflammation de l'Arachnoide, Cerebrale et Spinale. Par Parent Duchatelet et L. Martinet. Paris, 1821.

and full, and often irregular; but in the convulsive or paralytic period, it becomes frequent, small, and irregular. In the latter stage of the disease, both hearing and seeing are often totally lost, yet general sensibility, or the sense of touch, usually remains to the last moments. I have seen infants, perfectly deprived of the sense of seeing, and apparently of hearing, readily lay hold of the nipple and suck as soon as it was brought in contact with the lips, although in a continued state of stupor or sleep. The paralysis which occurs in the latter stage is always of the hemiplegiac kind. In most cases, small children keep one arm in continued motion. (Cheyne.) Martinet and Duchatelet state, that patients suffering under this disease exhale a very disagreeable odour, which they compare to the smell of mice.

Arachnites does not, however, always come on in the gradual manner and with the regular train of symptoms just described. Sometimes the disease commences and proceeds in a manner very similar to the infantile remittent; and at others it is ushered in by convulsions, without any perceptible antecedent febrile irritation. In this latter case, however, there is, perhaps, always some evidence of ill health, previous to the supervention of the convulsions, such as fretfulness, variable appetite, irregular state of the bowels, tumid abdomen, foul breath, swelled upper lip, starting, and grinding the teeth, during sleep, and other symptoms indicative of intestinal irritation. I have known the disease to commence and proceed to the last stage with scarcely any other symptom than slight febrile irritation, with little or no pain in the head, but a *constant and nearly ineffectual* desire to pass urine. In one instance there was not above a gill of urine discharged in twenty-four hours during the five first days of the malady, and no other particular morbid condition was perceptibly present. In this case the urine was not retained, for the introduction of the catheter brought off none. Dr. Monro observes, "that there are cases in which the little patient has a desire every hour to pass water;" and states that "he attended a child affected by this disorder, who passed for some days very little urine." The liver generally sympathizes strongly with the brain in its inflammatory affections. During the forming stage of the present complaint there is usually a deficiency of bile; but in its advanced periods, the bile is not only more copious, but vitiated in its quality—the stools acquiring from its admixture with the ordinary secretions and contents of the bowels a dark glairy, or deep green appearance, resembling, as Dr. Cheyne observes, "*chopped spinage.*"

Diagnosis.—The characteristic symptoms of the first stage are: irritability of temper; irregularity of the bowels; variable appetite; starting in sleep; transient flushes of the face; an irritated, quick pulse; an occasional frowning expression of the

countenance; wakefulness; and grinding the teeth. In the second stage: more or less continued pain in the head; torpor of the bowels; nausea and vomiting, particularly on assuming the erect posture; irregular febrile exacerbations; a peculiar distressed expression of the countenance; sudden starting from sleep; transient acute pain in the abdomen; a circumscribed flush on *one* cheek; intolerance of light and sound; hot and dry skin, with frequent, tense, and generally active pulse. In the last stage: constant somnolency; torpor of the intellectual functions; strabismus; paralysis of one or both upper eyelids; more or less hemiplegia, coma, and convulsions. From *infantile remittent*, arachnites differs in the great irregularity, both in relation to duration and time of recurrence of the remissions and exacerbations of the second stage. The appearances of the stools too will often assist us in the diagnosis between these two affections. In infantile remittent, the alvine discharges are fetid and of a dirty brown colour; in arachnitis, they frequently have a glairy and dark-green appearance. (Cheyne.) Dr. Coindet states, that a micacious deposition like crystals of boracic acid in the urine, is almost peculiar to hydrocephalus in its second stage.

M. Gintrae (Journal Generale de Médecine, 1825) gives the following, among a number of other diagnostic symptoms, between idiopathic arachnites or cerebral fever, and infantile remittent, or fever from intestinal irritation. In idiopathic cerebral fever, the abdomen becomes flattened; in infantile remittent, or fever from intestinal irritation, from worms, &c., the abdomen is almost always tumid and hard. In the former affection, costiveness almost invariably attends, and when alvine evacuations do occur, they are generally green, slimy, or gelatinous:—in the latter disease, there is frequently more or less diarrhœa, the motions being brown, mucous, and fetid. In idiopathic cerebral fever, the secretion of saliva is diminished: in fever from verminous irritation, it is generally increased. (Brera.) In cerebral fever, the tip and edges of the tongue are usually red: in fever from intestinal irritation by worms, the root and middle of the tongue is covered with a thick fur. In idiopathic cerebral disorder, the pain in the head is often extremely severe and continuous: in verminous fever, the pain is less severe, being obtuse and vague, the child seldom complaining of it as particularly distressing. In the former affection, the patient often directs his hand to the head: while in the latter, "it is usually to the nose that the fingers are directed, in consequence of the itching there." In verminous fever, we often perceive a movement of deglutition during sleep, and hiccough, with occasional slight convulsive movements of the thumb and index finger. In the idiopathic cerebral disease, the nostrils are dry; in fever from verminous irritation, they are usually moist. In the former there

is often a circumscribed flush on one or both cheeks; in the latter, the face is commonly pale and leaden. In cerebral disease, the temperature of the head is above that of the abdomen: in intestinal irritation, the reverse obtains. In the former the urine is small in quantity, red, and sedimentous: in the latter, it is sometimes clear and abundant; frequently whey-like, depositing a white sediment.

Dr. Johnson very justly observes, however, that "there is no one pathological symptom, which can be depended on as characteristic of idiopathic cerebral fever, nor yet of the intestinal." Our conclusions must be drawn from the whole of the symptoms taken collectively.

Dr. Alexander Monro has described a variety of hydrocephalus, which he calls the "hyper-acute form" of the disease, a form of very rare occurrence, and simulating in some, its most striking symptoms, inflammatory croup. "This rare form of the disease is very sudden in its attack. There is no previous headach, drowsiness, stupor, nausea, vomiting, paralytic state of any part of the body, or any other symptom denoting a derangement of the functions of the nervous system. It begins like croup. The child awakens in the night in a state of extreme agitation, and much flushed, and with a quick pulse; he is hoarse, and the sound of the voice when he inspires is similar to that of croup. The patient, at the onset of the disease, seems in a state of nervous irritation; often starts in his sleep, and in a short time, the disease assumes the appearance rather of a spasmodic affection of the larynx, than of the inflammatory croup. The matter thrown up by vomiting, consists generally of indigested food. The longer the disease continues, the shriller and hoarser the voice becomes."

In the dissections which were made of children who died of "this form of the disease, Dr. Monro found in one instance, the vessels of the pia mater at the corpora quadrigemina and tractus optici, and at the origin of the eighth pair of nerves, much distended with blood. No morbid appearance was discovered in the larynx and trachea." In another case, "the upper part of the brain, particularly the superior part of the posterior lobes, was covered with a transparent gelatinous effusion;" and about an ounce of coloured serum was found in the ventricles. "The vessels of the spinal marrow were turgid, those of the cervical portion of a vermillion-red colour, and those of the lumbar portion of a dark-red hue. *The eighth pair of nerves* was of a deep uniform red colour along its whole tract, as far as its branches, going to the lungs."

Dr. Burns attributes this form of hydrocephalus, "to an affection of the origin of the eighth pair of nerves, induced by the

state of the extremity of the fifth pair in dentition acting on its origin, which is near the eighth."*

Post mortem appearances.—In some cases the arachnoid membrane is minutely injected throughout its whole extent; in others it is opaque and thickened. On its surface, "a purulent, sero-purulent, or sero-gelatinous exudation" is a very common phenomenon; and it is still more common to find a greater or less portion of serum effused into the ventricles, between the lamina of the arachnoid, and into the cellular tissue between this membrane and the *pia mater*. (Martinet.) In some instances, however, little or no serum is found effused. Out of twenty-six cases related by Martinet and Duchatelet, there were eight, in which scarcely any trace of effusion into the cavities, or on the surface of the brain occurred. In some instances, the *substance* of the brain was altered in its consistence and colour; and in a few cases the whole surface of the arachnoid was covered with a false membrane.

Causes.—It would seem, that in some instances a hereditary or constitutional predisposition to the disease exists. I have known families, of which nearly all the children died during the period of dentition from arachnitis. It has been affirmed, also, that children of a scrofulous diathesis, are peculiarly liable to this affection, an observation which appears indeed to be well founded. In general, children of an irritable habit, with weak or deranged digestive powers, seem to be most liable to the disease. Dr. Mills† states, that in a large proportion examined, the appearances of scrofula were evident. And Percival observes, that out of twenty-two, eleven cases "were decidedly scrofulous."

Among the most common exciting causes, are: blows, falls, or other injuries of the head, causing more or less concussion; insolation, (*ictus solis*); suppressed habitual evacuations, or repelled chronic cutaneous eruptions; metastases of different kinds; intense and long-continued mental application; the intemperate use of ardent liquors; the protracted influence of the depressing passions; dentition; intestinal irritation; hooping-cough; cold, and in short, whatever is capable of at once deranging the digestive organs, and causing a preternatural determination of blood to the brain. The most common cause of arachnitis during childhood, however, is the combined influence of dentition, and intestinal irritation on the brain. If, while painful dentition is going on, the digestive functions suffer derangement, from improper diet or some other circumstance, there

* The Morbid Anatomy of the Brain. By Alexander Monro, M. D. 1827.

† A Pathological Inquiry into the Nature of Hydrocephalus. By Thomas Mills, M. D., &c. Dublin Hospital Reports.

will be two powerful causes of cerebral irritation and congestion present, which, under the general derangement of health which necessarily attends, will tend peculiarly to develope this fatal malady. *Intestinal irritation* is, indeed, very frequently the exciting, or perhaps, rather the predisposing cause of infantile arachnitis. The variable appetite; the irregular action of the bowels, and frequent unnatural appearances of the stools; the tumid abdomen and gastric tenderness; the picking and rubbing of the nose, and the pale and sickly aspect of the countenance which so often precede the development of the disease, all point to the alimentary canal, as the probable source of the primary irritation, with which the brain sympathizes. When such gastric irritation exists, the supervention of any additional exciting cause, such as a severe fall, or blow on the head, painful dentition, cold, &c., will often speedily develope this fatal malady. An interesting fact, corroborative of the observation that arachnitis and consequent effusion into the cavities of the brain is especially apt to result from intestinal irritation, is the circumstance that *cholera infantum*, when it assumes somewhat of a chronic form, terminates not unfrequently in death, under all the characteristic symptoms of the last stage of hydrocephalus. In two instances of this kind, in which I had an opportunity of a post mortem examination, I found the traces of arachnoid inflammation unequivocal, with copious serous effusion into the ventricles, and between the circumvolutions of the brain.* While we give all the importance to intestinal irritation, as a cause of arachnoid inflammation, which it unquestionably demands, we must bear in mind, that this same cause sometimes gives rise to a form of cerebral oppression, strongly resembling the last stage of arachnitis, but which is, nevertheless, wholly unconnected with cephalic inflammation. The determination to the head, in such cases, results merely in a state of strong venous congestion of the brain, giving rise to a somnolent and oppressed state of the system, which may be readily mistaken for hydrocephalus. (Cheyne.†)

Treatment.—There are three principal indications to be kept in view in the treatment of arachnoid inflammation—viz: 1. to

* An interesting and striking case, in which hydrocephalic symptoms were produced by organic disease of the intestinal canal, is related in the Med. and Chir. Rev. July, 1826. p. 102.

† Some writers contend, that hydrocephalus is almost invariably a sympathetic affection. Dr. Yeats in particular, thinks that this disease has almost invariably its origin in the irritation of some organ remote from the brain.(*a*) Spurzheim admits, that the primary irritation is frequently located in the abdomen; "yet anatomical dissections have convinced me," he says, "that, in the greater number of cases, the morbid appearances of the abdomen are secondary of the cerebral disease."

(*a*) Letter to Dr. Wall, &c.—*Med. Chirur. Journ. Jan.* 1819.

moderate the general arterial action ; 2. to obviate the local congestion and inflammatory action in the brain ; and 3. to remove those causes of irritation which tend to keep up a preternatural determination of the blood to the head.

When the disease becomes the object of medical attention in its *early* and incipient stage, the chief indication is to obviate local and general irritation, and to prevent undue determination of the blood to the head. With this view, the attention is to be particularly directed to the alimentary canal, for it is here that the primary irritation and immediate cause of cephalic congestion most commonly exists. *Laxatives* are accordingly among our most valuable means for preventing the full development of the disease whilst it is yet in its incipient stage ; and this is more especially the case in those instances which are attended with well-marked signs of intestinal disorder. As the liver is usually inactive, or functionally deranged, in the commencement of the disease, *calomel*, in small doses, succeeded by small portions of some of the milder purgatives, constitutes a very appropriate aperient in this affection. From one to two grains of this preparation should be given in the evening, followed next morning with a weak dose of Epsom salts, or of powdered rhubarb, for a child of from one to five years old. In some instances of impending arachnitis, with manifest intestinal and hepatic derangement in children, I have derived much benefit by giving a grain of blue pill every evening, followed by a few drachms of castor oil in the morning. The aperient and mercurial remedies should be continued daily until the alvine discharges exhibit a natural appearance. In addition to these means, the greatest attention must be given to the dietetic management of the patient ; for without an appropriate diet, little or no advantage can be derived from remediate treatment in this affection. The most simple and unirritating articles of food alone must be allowed, such as boiled milk, barley-water, arrow-root, boiled rice, oat-meal gruel, weak beef or chicken tea, &c.

When the arachnoid inflammation is once fully established, the plan of treatment should be promptly and decisively antiphlogistic, with revulsive and derivative applications. *Blood-letting*, ranks of course among our most efficient remediate means at this period of the disease, particularly when the inflammation is the consequence of some injury inflicted on the head, or where it results from general causes, such as cold. In such instances, the pulse is tense, quick, resisting, and sharp ; and in this case, the efficient abstraction of blood is indispensable. In those cases which arise sympathetically from disorder in the alimentary canal, the arterial excitement is not generally very active. Here blood-letting, though usually indicated, must be employed with more caution, for it is well ascertained that the

copious abstraction of blood, by weakening the powers of vital resistance, greatly favours the morbid sympathetic affections arising from intestinal irritation—(Armstrong, Marshall Hall, Travers.) In all instances, however, where the pulse indicates blood-letting, a sufficient quantity of blood should be taken away at once, to check, conspicuously, the activity and momentum of the circulation. After the symptoms of cerebral compression have ensued, sanguineous evacuations can be of little or no service; nevertheless, should the arterial excitement and cephalic congestion be considerable, blood should be abstracted even in this advanced stage of the disease.

With regard to the utility of *local bleeding* in this and other forms of encephalic inflammation, different opinions are expressed by practitioners. Nearly all the French writers on this disease are decidedly in favour of the local abstraction of blood. It appears, indeed, very reasonable to expect peculiar advantages from a mode of depletion which abstracts the blood more immediately from the affected parts; and yet, in relation to the present disease, a contrary opinion has been expressed by several eminent practitioners. Mr. North, in his work on the convulsive affections of infants, observes, "that he never found well marked symptoms of determination to the head removed by leeches, however freely they were applied." In cases in which the cephalic determination depends on *intestinal irritation*, this observation is no doubt well founded; for the blood which may be thus removed from the capillaries of the head, will be immediately replaced by the continued preternatural afflux of this fluid. It must be observed, moreover, that so long as the momentum of the general circulation is considerable, local bleeding can scarcely produce any other advantages than such as would result from abstracting the same quantity of blood by means of the lancet. General and adequate bleeding is, therefore, an essential preliminary to the beneficial employment of leeches or cupping. After the impetus of the circulation has been moderated by the use of the lancet, *leeching* the temples, and along the posterior parts of the ears, is a valuable auxiliary in the treatment of arachnitis. Cupping is, perhaps, preferable to leeching in adults, for this operation seems to be better calculated to derive the circulation from internal inflamed parts than leeches.

Purgatives are among our most useful means for subduing this disease. When the bowels are loaded with irritating substances, and the cerebral affection is symptomatic of intestinal irritation, laxatives are, in truth, the main stay of our hopes. They are, indeed, almost equally useful in idiopathic arachnitis; for besides their effect in evacuating irritating causes, they tend, very particularly, to diminish the afflux of blood to the brain.

and to moderate the general momentum of the circulation. In cases depending on a primary irritation of the alimentary canal, the *milder laxatives*, after the first thorough evacuation of the bowels by an active purge, should be employed, in such a way, as to keep the bowels in a relaxed state throughout the whole course of the disease. Repeated doses of the more *active purges*, though at first apparently useful in such cases, tend ultimately to increase the intestinal irritation, and consequently the cephalic affection. The first purge should be sufficiently active to evacuate the bowels well. Four or five grains of calomel, followed in a few hours by the occasional use of the infusion of senna and manna until free purging is produced, will answer well as a first purgative. The bowels must afterwards be regularly evacuated three or four times daily, by the use of small doses of calomel, promoted by castor oil and laxative enemata. It must be recollected that intestinal irritation is not always dependant solely on the presence of acrid or irritating matters in the bowels. The mucous membrane of the alimentary canal may be in a state of subacute inflammation, with more or less of abrasion, or perhaps ulceration. Under these circumstances, the milder *laxatives* are manifestly more appropriate than the more irritating articles of this class, since they are sufficient to evacuate the contents of the bowels, without causing injurious irritation. In idiopathic arachnitis, however, the bowels are almost always very torpid, and can seldom be adequately moved, without the employment of the more active purgative remedies. In cases, too, that are attended with a great accumulation of fecal matter in the bowels, brisk and frequent purgation is particularly necessary. "Should we ascertain," says Dr. Cheyne, "that the alimentary canal is torpid, and imperfectly performing its functions, and admitting an accumulation of feculent matter, or that the secretions flowing into it are vitiated or diminished in quantity—circumstances which we ascertain by the peculiarity in the appearances or the pungent fetor of the stools, we must, by steadily pursuing the purgative plan, endeavour to effect a change; for while this is produced in the appearance of the stools, we are effecting a most important change in the hepatic system of the alimentary canal, and of all the parts which are connected with them."

Calomel should enter largely into the purgatives employed in this disease. From one to three grains, according to the age of the patient, may be given every two or three hours, until from ten to twelve grains are administered, and followed by a dose of infusion of senna, or sulphate of magnesia, or castor oil. In cases where there is reason to suspect the presence of worms in the bowels, anthelmintics should be employed in conjunction with purgatives. An infusion of spigelia and senna may be used in such instances. The stomach, however, is often so extremely

irritable in this disease, that no articles will be retained a sufficient time to operate on the bowels. Where this state exists, we must endeavour, in the first place, to allay the gastric irritability, and this may in general be effected by minute doses of calomel and ipecacuanha: the one-sixth of a grain of the former, in union with one-fourth or one-third of a grain of the latter, has repeatedly succeeded in my hands to restrain the tendency to vomiting in this disease.

Mercury has been much recommended as a remedy in this affection. One of the only two cases of recovery from apparently completely developed arachnitis, which have occurred in my practice, appear to have been brought about by the mercurial influences. Drs. Percival, Dobson, Rush, and Cheyne, mention cases which yielded to the powers of this article. Employed with a view to its constitutional influence, mercury often contributes very decisively to the reduction of visceral inflammation, and experience has shown, that in the present affection, its powers are sometimes unequivocally beneficial. The best mode, perhaps, of employing mercury in this disease, with a view to its salivant operation, is in the form of frictions with the *ungt. hydrar.* In whatever way mercurials are used, it is always extremely difficult in children to procure its salivant effects. Almost the whole surface should be frequently rubbed with the mercurial ointment, where this effect is desired.

Nothing is more common in the treatment of this disease, than the application of blisters to the shaven scalp; but this practice is, I conceive, of very doubtful propriety. I have always preferred placing them on the back of the neck or behind the ears, while ice or cold water is applied to the top of the head, and warm or rubefacient applications made to the feet. Dr. North, whose interesting work I have already mentioned, observes, "that blisters to the head are decidedly prejudicial in the convulsive diseases of infants;" and the same observation is applicable, I think, to the disease under consideration. The application of ice or iced water, in the manner mentioned in the last chapter, may be accounted a very useful auxiliary in the treatment of arachnitis, and to favour its revulsive influence, warm or stimulating applications to the feet may be usefully employed. Dr. Regnault recommends, in very strong terms, the application of *moxa* in this complaint;* and its known efficacy in subduing deep-seated articular inflammation, justifies the expectation of considerable advantage from its use in arachnoid inflammation. Neither this application nor blisters, however, should be resorted to, until the activity of the circulation is reduced by general and local blood-letting. The tartar emetic ointment also, may be very beneficially applied. (Monro.)

* Medical and Physical Journal, vol. xl. p. 16.

Dr. Stocker* of Dublin, speaks much in favour of the use of *James's powder* in hydrocephalic affections. He asserts that this preparation possesses peculiar powers to diminish the determination of the blood to the head; and of its tendency in this way, I have myself known several examples in other cephalic diseases. It may be conveniently given in small but frequent doses, in union with calomel, in this affection. Drs. Cheyne and Monro speak in equally favourable terms of this preparation in this dangerous disease. The latter states, that he has cured several cases of this disease by a plaster composed of tartar emetic and wax ointment applied to the head, and the use of calomel combined with James's powder. This combination, he says, is particularly useful in restoring the healthy action of the bowels.

Dover's powder, also, has found advocates as a remedy in this disease. Drs. Brooke, Percival, Cheyne, and Crampton,† all speak favourably of its employment in hydrocephalus. After adequate depletion and purgation, in cases connected with intestinal irritation, small doses of this composition often prove serviceable, by allaying general irritability, and inducing a gentle diaphoresis. In the idiopathic form of the disease, however, opiates of every description must be carefully avoided, as their tendency to increase the flow of blood to the brain could hardly fail to prove injurious. When preternatural determination to the head depends on a remote focus of irritation—as in the mucous membrane of the bowels—opiates, by diminishing nervous excitability as well as local irritation, will occasionally reduce also the irregular determinations which depend on such irritations. It is in cases of this kind only that we may venture on the exhibition of Dover's powder, and not in these instances until the impetus of the circulation has been moderated, and the alimentary canal well evacuated.

It would seem, from the observations of Mr. Newnham, that *green tea* has a powerful tendency to lessen the morbid vascular action, not only of the system generally, but especially of the brain. "In the acute irritation of the membranes of the brain in children," he says, "the efficacy of green tea has been strongly marked in my practice. Exhibited during the early symptoms, as soon as a sufficient quantity of blood has been taken, and before effusion occurs, it has proved a more powerful means than any other we possess, of controlling the morbid action, which, if suffered to proceed to its second stage, is scarcely to be overtaken by any treatment."‡

* Dublin Medical Essays, Anno, 1806.

† Transactions of the Associat. of Fellows and Licentiates of the Queen's College of Physic in Ireland, vol. vii.

‡ Med. Chir. Rev. July, 1827.

Sect. III.—*Cerebritis—Softening of the Brain.*

(*Ramollissement du cerveau.*)

This form of cerebral disease has of late been particularly investigated by the French pathologists. Recamier, Bayle, Cayol, Bricheteau, Rostan, and Lallemand,* have published numerous and interesting observations concerning its symptoms and pathology. The disease, as it is manifested on dissection, consists of a *softening* or a kind of liquefaction of a portion of the cerebral mass, with vascular injection of the surrounding substance. Rostan divides the disease into two periods.

The symptoms of the first period are: a fixed and violent pain in the head, often continued for several months; vertigo; obtuseness of the mental faculties; confusion of the ideas; and weakness and temporary loss of memory; questions are answered after long hesitation; and the patient appears at times dejected, querulous, and wholly indifferent to surrounding objects. There is generally a sensation of tingling and numbness in the extremities of the fingers; vision is often perverted, and in some instances, total blindness occurs at times. The hearing is almost always dull, but in some cases the reverse obtains, the sense of hearing being morbidly acute. Some complain of tenderness of the epigastrium, with constipation and variable appetite. The pulse is often full and hard, and sometimes intermitting. Occasionally, there is temporary delirium, with fever and much agitation.

The second period is characterized by the gradual or sudden supervention of paralysis of *one* limb, sometimes of half the body; but consciousness and intellect remain. Questions are now answered with very great difficulty, the patient generally expressing his desires by automatic movements. In some instances, a complete state of coma occurs, followed occasionally with convulsions.

In most instances, a sudden attack of convulsions is the first symptom that excites alarm. These convulsions often continue for many hours, followed, in some cases, with deep coma and a *contracted state of the flexor muscles of the limbs.* Occasionally, the paroxysms of convulsions recur repeatedly at short intervals, "the patient being sensible in the intermediate periods, and complaining of headach, till, after twelve or twenty-four hours, coma supervenes. From this state there is often a complete recovery for several days, when, without any warning, the convulsions return, and end in fatal coma."

* Recherches Anatomics, Pathologiques sur l'Encepalite. Paris, 1820.

In a case which came under my care, the patient complained at times of a deep-seated pain in the head ; his memory for particular names and things was greatly weakened—so much so that he forgot the name of the street he lived in ; and was several times obliged to inquire the way to his own house, although but a square from it. He became taciturn, and uttered his words with a kind of hesitating doubt. He continued in this condition for five or six weeks before he was confined to his room. The pain, however, at length became very severe ; the pulse was very hard and strong ; the countenance flushed ; and the bowels costive ; but there was no delirium, and he experienced short intervals of perfect ease from the cephalic pain. After five or six days longer, double vision, great confusion of mind, and hesitancy of speech occurred, and at last deep coma, contraction of the extensor muscles of the forearms, convulsions, and death ensued.

In this instance, the membranes of the brain did not exhibit any morbid appearances, except much vascular congestion. On slicing away the superior part of the brain, it appeared to be in a perfectly natural state; on making a deeper section, however, three portions of the cerebral substance were discovered in a state of complete disorganization—being of a soft pap-like consistence, of a yellowish colour, and in one place of a darkish hue, as if dissolved blood had been mixed up with the softened portions of the brain. One of these disorganized portions was in the left posterior lobe of the cerebrum, and the other two near the corpora striata and thalami opticorum.

The inflammatory nature of this softening of the brain has been much doubted by some. It has been supposed to be the consequence of a process similar to that which occurs in the softening of tuberculous matter in the lungs, and which, according to Laennec and some other writers, is *sui generis*, and wholly independent of inflammation. The facts and arguments adduced by Lallemand, however, render the opinion of its inflammatory character, in most instances at least, extremely probable. This writer thinks that the *softening* is the "effect of inflammation arrested in its course by death, *before* purulent suppuration has had time to take place."

It is most probable, as Dr. Abercrombie* observes, that this affection occurs under two modifications, one unequivocally attended with cerebral inflammation, and the other a species of cerebral gangrene from defect of circulation, in consequence of a diseased state of the arteries of the brain—an opinion which, he thinks, is confirmed by the fact, that the peculiar softening

* Pathological and Practical Researches on the Diseases of the Brain, &c. By John Abercrombie, M. D. London, 1827.

of the brain mentioned by Rostan, as unconnected with symptoms indicating an inflammatory action, occurs almost exclusively in very aged individuals, inasmuch as ossification of the cerebral arteries is very common in elderly people.

"In the cases of Rostan," says Dr. Abercrombie, "the disorganization was observed chiefly in the external parts of the brain; it occurred almost entirely in very old people, few of his cases being under sixty years of age, many of them seventy, seventy-five, and eighty. It was found in connexion with attacks of a paralytic or apoplectic kind, many of them protracted; and was often found combined with extravasation of blood, or surrounding old apoplectic cysts. On the contrary, the affection which I had been anxious to investigate, was found chiefly in the dense central parts of the brain, the fornix, septum lucidum, and corpus callosum, or in the cerebral matter immediately surrounding the ventricles: and occurred in persons of various ages, but chiefly in young people and in children. It took place in connexion with attacks of an acute character, chiefly of the character of acute hydrocephalus; and it was in many cases distinctly combined with appearances of an inflammatory character, such as deep redness of the cerebral matter surrounding it, suppuration bordering upon it, and deposition of false membrane in the membranous parts most nearly connected with it. We may even observe in different parts of the same diseased mass, one part in the state of *ramollissement* or softening, another forming an abscess, while a third retains characters of active inflammation, and probably exhibits, as we trace it from one extremity to the other, the inflamed state passing gradually into a state of softening. This is the infection which I have endeavoured to investigate, and which I consider as one of primary importance in the pathology of acute affections of the brain, and which I cannot hesitate to consider as the result of inflammation."

One of the most characteristic phenomena of *softening* of the brain, is a rigid contraction of the flexor muscles of the limbs. "Sometimes," says Lallemand, "this amounted only to simple rigidity of the limbs; at others, it was carried so far that the patient's fist was kept rigidly applied to the shoulder and the heel to the buttock;" and, contrary to what takes place in apoplexy, the mouth is drawn towards the paralysed side. In general, the function of respiration remains entirely free from disorder, till within a few days of the fatal conclusion of the disease.

The exciting causes of this form of cerebral disease are, no doubt, very various. Aneurism of the heart appears to be capable of exciting the disease. In many cases, says Lallemand, suppression of some habitual sanguineous evacuation preceded the attack of this affection; the depressing mental emotions seemed, in some instances, to have favoured its occurrence; and

"many of the victims had been greatly addicted to the immoderate use of vinous and other fermented liquors." Dr. Johnson states that he has seen several cases which induces him to believe that "*venous* congestion of the meninges of the brain, has a very considerable effect in producing softening of the brain as well as sudden death."* I have seen a case of a pap-like and yellowish-brown disorganization of an internal portion of the brain, which occurred in consequence of a severe blow received on the head six months before the supervention of the disease.

Treatment.—General and local blood-letting; sinapisms to the feet; cold applications to the head; active cathartics; blisters to the back of the neck; and calomel with a view of its salivant operation, constitute the efficient means for combating this formidable malady. Unfortunately, however, the disease often proceeds to a state of disorganization before it becomes the object of medical attention, and then of course all remediate treatment must be abortive.

CHAPTER XI.

OF THE PHLEGMASIÆ OF THE RESPIRATORY ORGANS.

Sect. I.—*Pneumonia.*

The term pneumonia is employed, in a general sense, to designate acute inflammation within the cavity of the thorax, whether seated in the pleura, the mucous membrane of the bronchia, or in the proper substance of the lungs. The general characteristic symptoms of acute inflammation in the chest are:—cough, difficult and painful respiration, fixed pain in the thorax, and fever. Considerable difference occurs, however, in the character of these symptoms, as well as in the other usual concomitant phenomena, according as the one or the other of the three structures just named is the principal or exclusive seat of the inflammation. Cullen was of opinion, that the pleura can never be inflamed without an extension of the inflammation to the pulmonary structure; pleuritis, according to his views, being always accompanied with more or less of peripneumonic inflammation. The observations of later pathologists,† however, have proved that the pleura is often exclusively inflamed, and that

* Medico-Chirurgical Review, December, 1822, p. 485.
† Laennec.

pleuritic inflammation is generally marked by symptoms sufficiently characteristic to enable us to distinguish it from acute inflammation of the proper pulmonary substance. Without doubt, pleuritis is very generally attended with inflammation of the subjacent tissues; but its occasional separate existence is equally unquestionable.

Pleuritis.—Pleurisy.

In *pleuritis*, a violent and pungent pain is felt in the chest, generally on one side, which is always greatly increased by a full inspiration, or on coughing. Respiration is hurried, short, and generally most oppressed when the patient lies on the affected side. The cough is short and dry, or attended with a glairy and nearly colourless sputa, and stifled as much as possible, to avoid the great increase of pain which it occasions. When the inflammation extends to the lungs, the expectoration is generally mixed with more or less of blood. The face is usually suffused with a vivid flush; the pulse very hard, full, vigorous, and frequent; the tongue covered with a thick white fur; the skin hot and dry; and the urine of a deep red colour, and small in quantity. The act of respiration is performed chiefly by the action of the diaphragm and abdominal muscles, the motion of the ribs being restrained by the patient, on account of the increase of pain which it always causes.

Acute inflammation of the pleura, is, however, not always attended by the foregoing unequivocal manifestations of its presence. In some instances, the disease, though rapid in its course and violent, is attended with scarcely any pain or cough. Baglivi mentions examples of this kind; and Schmidtmann has given the history of several cases of what he calls *pleuritis occulta*.* Mr. Tacheron gives an account of a fatal case, in which there was but little pain, and *no cough*, although the pleura was found, on dissection, coated with a yellow albuminous matter, a line in thickness, and a large quantity of fluid effused into the thorax.† Bichat also refers to the circumstance of the occasional absence of pain in the chest in acute inflammation of the pleura.

Causes.—Pleuritis is most apt to attack persons of a vigorous and plethoric habit of body. The influence of cold, when the body is in a state of perspiration from active exercise or confinement in a heated room, is its most common exciting cause. Pleurisy may also arise from metastasis of other affections—particularly of rheumatism, gout, and erysipelas; and it has been

* Summa Obs. Med. vol. i. p. 108.

† Rechérches Anatomico-Pathologiques, &c.—Vide Med. Chir. Rev. March, 1824.

known to occur in consequence of suppression of the catamenial and hæmorrhoidal discharges.

Pleurisy from translated rheumatism or gout, is by no means an uncommon occurrence. I have met with a considerable number of cases of this kind, and one recently which was a strongly marked instance. The patient was affected for several weeks with severe rheumatic inflammation of the left elbow joint. A cold poultice was applied to the joint in the evening, and on the next morning, the pain and redness had in a great measure subsided. In the afternoon, a severe pain came on in the left side of the thorax, which rapidly increased in violence, and soon exhibited all the characteristic phenomena of pleurisy, whilst the pain in the elbow disappeared entirely. It was successfully treated with blood-letting, blisters, and the internal use of calomel and opium. In a few weeks after recovering from this attack, subacute rheumatic inflammation occurred in the elbow of the *right* side.*

Pleurisy and depôts of pus in the lungs, are sometimes rapidly developed after capital surgical operations. M. Velpeau, in a very interesting memoir, has given the following as the result of his observations on this subject: 1. "Those who die of acute diseases succeeding surgical operations or profuse suppurations, generally fall victims to pleurisy, and the formation of abscesses more or less numerous in the lungs. 2. That kind of pleurisy hitherto undescribed is of a peculiar nature, and might be denominated the pleurisy succeeding surgical operations. 3. That this disease differs from simple pleurisy in the latency of its progress, the rapidity of its course, and the almost invariable certainty of its fatality. 4. That the pleurisy and formation of depôts of matter are rarely accompanied by characteristic local symptoms sufficient to give notice of their existence." M. Velpeau ascribes these secondary pneumonic affections to the absorption of pus, and its passage into the current of the circulation.†

Post mortem appearances.—On dissection, the pleura is generally found uniformly red, or punctuated with small red specks of irregular shape and very close together. Laennec states, that these red points "occupy the whole thickness of the pleura, leaving small intermediate spaces retaining the natural white colour." The pleura is not often found thickened in consequence of inflammation. Extravasation on the inner surface of this membrane is a never-failing occurrence in fatal cases of this disease. Laennec thinks that this extravasation commences with the inflammation. The matter thus thrown out by the vessels of the

* For much interesting information concerning *rheumatic pneumonia*, the reader is referred to Stoll's Ratio Medendi, &c. part. i. p. 82—and to Schmidtmann's Summa Observ. Medicarum, tom. i. p. 62, et seq.

† Revue Medicale, December, 1826.

inflamed pleura, consists of a *semi-concrete* or pseudo-membranous substance, or of coagulable lymph, or of sero-purulent fluid effused into the cavity of the chest. This fluid generally contains small flocculi or filaments of coagulable lymph or of concrete pus, and is either of a light-yellow colour and nearly transparent, or reddish, as if a small portion of blood were mixed with it. Adhesions between the costal and pulmonary portions of the pleura occur in nearly all instances through the intervention of false membranous substances.*

Prognosis.—Acute pleuritis is not, in general, a very dangerous affection in subjects of a good and vigorous constitution. There is no inflammatory affection which is more under the control of an active antiphlogistic treatment. In subjects, however, of a weak habit of body—and especially in such as are predisposed to phthisis pulmonalis, pleurisy, if not a disease of much immediate danger, is to be dreaded on account of its tendency to develop pulmonary consumption. When the inflammation extends to the substance of the lungs, the patient may sink at an early period from effusion into, or disorganization of its structure. The following circumstances may be regarded as indicative of imminent danger in this affection. A frequent effort to sit up, particularly when there is a wheezing sound in the trachea, bloody expectoration,† and an obstructed pulse. The supervention of diarrhœa is a most unfavourable sign; convulsions and coma are no less ominous of a fatal tendency. Schmidtmann asserts, that he has never known an instance of recovery from this disease, after convulsions and coma had supervened.

Peripneumonia.—Inflammation of the lungs.

When the parenchymatous substance of the lungs is the prin-

* The false membranes produced in pleurisy, generally change after some time into a kind of cellular tissue, "or rather into a true serous membrane, like that of the pleura. This change," says Laennec, "is produced in the following manner: the serous effusion which accompanied the membranous exudation is absorbed; the compressed lung expands, and the false membrane investing it and the costal pleura become united in one substance. By degrees, this substance becomes divided into layers pretty thick and opaque, which are separated by a very small portion of serosity. About this time the blood-vessels begin to make their appearance in it, the first rudiments of which have the aspect of irregular lines of blood, much larger than the vessels which are to take their place. After a time the pseudo-membranous layers become thinner and less opaque; the lines of blood assume a cylindrical shape and ramify in the manner of blood-vessels. Eventually, the layers of the false membrane become quite transparent, and nearly as thin as those of the ordinary cellular tissue. By degrees, it acquires the firmness of the natural cellular substance, and becomes the bond of a firm union between the lungs and the costal pleura."

† Baglivi says, "Erectum sedere velle in morbis acutis pulmonum perniciosum ac ferme lethale, præsertim, si adsit sibillus in aspera arteria, et difficultas excreandi sputi, et licit cum talibus signis pulsum bonum videris, noli credere, nos fallit."—*Opera Omnia*, p. 42.

cipal or sole seat of the inflammation, the disease is designated by the term *peripneumony.* In this variety of thoracic inflammation, the breathing is much oppressed, particularly when the patient is in a horizontal posture; an *obtuse* pain is felt in the chest, generally in the region of the sternum, sometimes in the epigastrium, and occasionally in the side or scapular region. The cough is attended with a copious viscid expectoration, mixed more or less with blood. The skin is hot and dry; the urine high-coloured and scanty; and the pulse frequent, full, obstructed, labouring, but rarely very hard; but in the advanced stage of the disease, it usually becomes weak, soft, obstructed, and irregular. In violent cases, tending to effusion or disorganization of the inflamed portion of the lungs, the countenance acquires a livid aspect, and the veins of the neck become turgid. The patient generally lies on the affected side, although in some instances, the reverse position is preferred. "The sputa are white, slightly yellowish or greenish, somewhat diaphanous, and intermixed with bubbles of air. The tenacity of the matter expectorated is so great, that we may often reverse the vessel which contains it, and retain it in this position for a time without detaching it from its sides." Laennec regards this kind of sputa as pathognomic of this affection, "since it is the only one," he says, "that is found exclusively in it."

In this, as in the former variety of pneumonic inflammation, the symptoms are sometimes so inconspicuous and equivocal in their character, that the true nature of the disease may remain doubtful, or be entirely mistaken, until fatal disorganization has occurred in the pulmonary structure. An instance of rapid fatal pneumonia is reported by Dr. Damiron, one of the physicians of the hospital *Val De Grace,* in which no pain whatever was complained of by the patient, nor did epigastric pressure produce any uneasiness. The breathing was difficult, the cough frequent, the expectoration ropy and copious. On dissection, three-fourths of the right lung was hepatized, and the left lung was black and crepitous.* M. Andral has related seventeen cases, in which one or more of the characteristic signs of the disease were absent. In several instances, there was neither pain nor cough.†

Pneumonia Biliosa.—Bilious Pleurisy.

There is a modification of pneumonia, which, from the prominent symptoms of hepatic disorder which it exhibits along with the ordinary phenomena of pneumonic inflammation, has

* Med. Chir. Rev. October, 1825.
† Clinique Médicale, &c. Par G. Andral, Paris, 1824.

been termed *bilious pneumonia.* This variety of the disease occurs during cold and variable seasons, in districts abounding in sources of miasmatic exhalations. It appears to be the result of the combined agency of *koino-miasmata* and atmospheric vicissitudes. The initial symptoms of this modification of the disease differ very little from those which usually usher in an attack of ordinary bilious remittent fever. In some instances, a sense of fulness and tension is experienced in the right hypochondrium, a few days previous to the supervention of the disease, and occasionally dysenteric symptoms occur before the fever commences. In almost all cases, considerable pain is felt in the back and extremities during the premonitory period. The skin from the beginning is more or less tinged with bile, and the conjunctiva, especially, is often conspicuously icterode. The face is flushed, "and a sickly mixture of red and yellow, upon close examination, betrays the existence of a disturbed state of the liver." (Potter.) Acute pain in the forehead is almost constantly present. The pain in the chest is sometimes extremely severe and pungent; but more commonly it is obtuse, and attended with a sense of weight or oppression in the breast. In some cases, the fever continues for several days before the pectoral pain supervenes. The expectoration is not very copious—the sputa being of a frothy yellowish appearance, marked frequently with streaks of blood. The fever is generally attended with manifest evening exacerbations and morning remissions. When vomiting takes place, an occurrence very common in this affection, more or less of bilious matter is generally thrown up, although, in some instances, the secretion of bile appears to be entirely suspended; the ejections consisting of nothing else than gastric mucus and the ingesta. The tongue is at first white, with a yellowish streak along the middle, which, as the disease advances, becomes dark-brown and dry. The urine is always of a deep yellow or bilious colour; and the pulse is generally small, frequent, and quick, with a slight degree of preternatural tension.

Post mortem appearances.—The morbid structural changes produced in the lungs by inflammation, are:

1. *Engorgement*, the inflamed portion of the lungs exhibiting externally a brown mottled or violet colour, "which forms a strong contrast with the gray or pale rose-colour of the healthy part." It is of a firmer texture, and heavier than in the sound state—feels crepitous under the finger, though less so than in the healthy condition; and on being pressed between the fingers, the air-cells will be perceived to contain a considerable portion of extravasated fluid. When the engorged portions of the lungs are laid open with the knife, a large quantity of a frothy reddish serosity runs out, and the internal structure exhibits a livid red

appearance. If portions of the engorged lung are pressed until all the fluid has been squeezed out, they become as elastic and crepitous, and of the same colour as the healthy part, if air be blown into them. Simple engorgement appears to be the result of the weakest grade of acute inflammation, and may even arise mechanically from mere sanguineous congestion during the last moments of life, or in articulo mortis. (Andral.) When the inflammation is intense, and terminates in the above engorged condition, the structure of the lungs is at the same time rendered soft or friable, being readily broken down when pressed between the fingers. To distinguish mere engorgement by extravasated fluid from sanguineous congestion and engorgement from inflammation, we must judge less, says Andral, from the colour than the degree of firmness of the pulmonary structure. In almost every instance arising from inflammation, the substance of the lungs is rendered more or less friable.

2. *Hepatization*, presenting at first sight the appearance and consistence of liver. In this variety of structural change, the lung is impermeable by air, and is entirely deprived of its crepitous feel under the finger, and sinks when put into water. When cut into, a small portion of a reddish fluid issues, without exhibiting any frothy appearance. If we examine the incised surface with a lens, we perceive that the lung has lost its cellular structure—the pulmonary substance exhibiting a red granulated appearance; and on being pressed between the fingers, is found to be readily broken down and reduced to a reddish pulp. (Andral.) When a lung is hepatized, its volume seems much greater than natural, "but this apparent enlargement is caused merely by the diseased lung not collapsing." This morbid condition has been called *red* hepatization.

3. *Gray hepatization.*—This seems to be the result of a more intense degree of inflammation than that which gives rise to *red hepatization.* In the present morbid condition, the pulmonary structure is granular, condensed, and impermeable to air, as in the preceding variety; but its colour is *grayish or yellowish pale*, and when cut into, discharges copiously an opaque yellowish or grayish fluid, which is manifestly purulent, and almost entirely without smell. In some cases, the pus does not issue spontaneously from the incised surfaces, but on pressing the tissue moderately, small drops of purulent fluid are forced out. In this variety of disorganization, the pulmonary tissue is softened, and readily converted into a grayish pulp by pressure between the fingers. *Acute* inflammation of the lungs never terminates in *induration* of its structure; this termination is peculiar to *chronic* pulmonary inflammation. According to Andral, there are two varieties of induration, the *red* and the *gray.*

4. *Gangrene.*—This is a very rare termination of acute inflammation of the lungs. Andral gives an account of two instances of this kind. In a late number of the *Journal Hebdomadaire*, there are several cases reported, which terminated in gangrene of the pulmonary structure. These cases were attended with an intolerably fetid and gangrenous breath, particularly during the fits of coughing, and the matter expectorated was of a chocolate colour, and emitted a most offensive smell. On dissection, a considerable portion of the lung was found converted into a putrid mass, containing fragments of pulmonary texture, and of a black or violet colour. The surrounding portions of lung were infiltrated and partly hepatized. Dr. Chambers, also, has published some cases of gangrenous suppuration of the lungs, in which he refers particularly to the intolerable fetor of the breath as a diagnostic sign of this mode of termination. Andral states, that at first the expectoration is a greenish liquid, then dirty gray, at times reddish, and exhaling an extremely fetid smell.*

The formation of *abscess* from pneumonic inflammation, is also a very rare occurrence. Both Laennec and Andral assert, that pulmonary abscess is among the most uncommon terminations of acute inflammation of the lungs. The former met with but four or five instances in several hundred cases which he examined; and the latter writer states that he has met with one case only.

Laennec observes, that "nothing is more uncommon than to find the inflammation confined to the superior lobes of the lung." This, however, is contradicted by the observations of Andral, who, in 88 cases, found 47 with inflammation of the inferior lobe, 30 of the superior lobe, and eleven instances in which the whole lung was affected.

Diagnosis.—The most important diagnostic signs between pleurisy and peripneumony, are those obtained by percussion of the chest, and by pressure made on the abdomen. In peripneumony, percussion made with the extremities of the fingers brought together in a line, produces an *obscure* dull sound, which is best estimated by comparing it with the sound produced by percussion of the healthy side of the chest. In pleurisy, on the contrary, no difference can be perceived in the sound produced by percussion of the two sides of the thorax. In peripneumony, firm pressure on the abdomen with both hands, so as to push up the diaphragm against the lungs, almost invariably excites cough,

* Schmidtmann, in an account of a case of pneumonia which terminated in gangrene of the lungs, says, "impar sputes saniosis, fuscis, nigris, *putentibusque* reddendis."—*Sum. Ob. Med.* vol. i. p. 80.

Cases of gangrene of the lungs are also reported by MM. Martinet and Recamier in their Hospital Reports.—See *Revue Médicale* for 1827.

great oppression, and a sense of suffocation; whereas, in pleurisy, no such effects result from abdominal pressure. "If, then, we find united in the same patient a clear sound of the painful side on percussion; insensibility to abdominal pressure; smallness and rapidity of the respiration; an increase of pain on full inspiration; particular uneasiness on lying upon the affected side;* and, lastly, pain upon firm pressure of the intercostal spaces of the affected side, we have little reason to doubt of the existence of pleuritic inflammation." (Roux.)

Peripneumony is characterized by an obscure pain in the chest; great efforts at inspiration, in order to supply the suspended functions of one part of the lungs; increased suffering on firm abdominal pressure, and a dull obscure sound on percussion of the chest. Difficulty of lying on the *sound* side is generally mentioned among the characteristic symptoms of peripneumony; but Andral asserts, that this observation is by no means generally correct. The most common position is on the back.

Auscultation, or the employment of the *stethoscope*, has of late years attracted much attention, as a means for obtaining a correct diagnosis in pectoral diseases. Interesting information, with respect to the particular condition of thoracic affections, is no doubt to be obtained from this mode of examination; but it requires much careful experience before a sufficient *tact* is acquired to procure satisfactory information in this way. M. Andral, who has paid much attention to this subject, has given the following account of his experience in *auscultation* in pneumonic inflammation.

"No sooner does the pain and difficulty of breathing come on, than the ear, applied to the thoracic parietes, recognises a notable modification in the nature of the noise heard at each inspiration, and as the inflammation advances, the noise undergoes fresh modifications, which indicate, with more or less precision, the situation and degree of the affection. The voice is also modified.

"At the commencement of the disease, whilst the lung is in the state of *simple* inflammatory engorgement, the noise of respiration in the affected part loses its clearness, and is more or less mixed with the *dry-rattle*, which Laennec terms *crepitous*, from the resemblance it bears to the noise emitted by common salt when thrown upon hot coals. It also bears considerable resemblance to the peculiar noise occasioned by folding or doubling a piece of parchment. The noise of natural respiration is always altered and obscured by this *rattle*, but is not always entirely masked or concealed by it. As the inflammation increases, the rattle becomes more and more manifest, until at length it entirely

* This arises from the lungs pressing on the inflamed pleura when the patient lies on the affected side.

conceals the inspiratory murmur. The presence of crepitous rattle indicates engorgement, or the first stage of inflammation; and so long as it continues, it shows that the inflammation (in a great part at least) has not advanced beyond the first degree. From its greater or less intensity, and from its more or less strong admixture with the natural respiration, we may derive indications of the degree to which the engorgement extends, and whether it is passing into the state of hepatization or otherwise. Whilst the noise of natural respiration predominates over the crepitous rattle, we may conclude that the inflammation is slight; but, if the rattle increases, and predominates in its turn, until at length it completely masks the respiration, we may be certain that the inflammation is advancing, and that it is passing on to the second degree.

"At a more advanced period, the crepitous rattle gradually ceases to be heard; and if the natural respiration then returns, we know the disease is subsiding; but if there be no respiratory murmur audible, or if the natural respiration is replaced by *another kind* hereafter to be described, we may be certain that the disease is becoming more serious, and that the lung is hepatized.

"M. Laennec has established the fact, that, in many cases, when engorgement of the lungs is succeeded by hepatization, the ear applied to the chest *feels* the motions of the thoracic parietes, but does not *hear* any respiratory noise, either natural or pathologic. We have often verified this statement; but we have also frequently observed, in the same stage of the disease, another very remarkable phenomenon, which appears to have escaped Laennec's attention. In certain cases, where the lung is in the state of red or gray hepatization, the noise of respiration does not disappear, but is *modified* in a singular manner, and is evidently different from the natural kind. It seems as if a person placed near the auscultator's ear breathed forcibly through a brazen tube; there is at the same time a peculiar kind of *resonance* of the voice, wherever this kind of respiration is audible. The modification of the voice, is not properly either *egophony* or *pectoriloquism;* it approaches more nearly to that form of resonance which is observed in dilatation of the bronchia. Whenever cases presenting this double modification of the voice and respiration have proved fatal, dissection has constantly presented either red or gray hepatization, or pleuritic effusion.

"The explanation of this modification of the voice and respiration seems easy. It appears to us to depend upon the air not being able to penetrate farther than the large bronchial tubes; and, for this reason, the phenomena are manifested, not only in pulmonary hepatization, but also where the lung is compressed by pleuritic effusion:—and, in short, wherever the air is prevented reaching the air-cells of the lungs.

"Whilst auscultation of the diseased side affords the different signs already enumerated, the respiration of the healthy side is heard with much greater intensity than in the physiological state;—as if it were necessary for the *healthy* lung to receive a greater quantity of air in a given time, in order to supply the deficiency of the diseased one.

"When the inflammation occupies a circumscribed portion, situated at a distance from the surface of the lung, more especially a part of the base of the centre or of the root, auscultation teaches us nothing concerning the seat or degree of the disease."*

Prognosis.—A copious expectoration of a thick uniform yellowish matter, is one of the first, and perhaps most encouraging indications of a favourable turn of the disease. When this symptom occurs in connexion with an increased flow of sedimentous urine, and gentle diaphoresis, we have good grounds for predicting a favourable issue of the disease, more especially, if at the same time the oppression and pain in the chest abate, and the cough is less troublesome. When, on the contrary, the pain and oppression become more generally diffused throughout the thorax; when the cough is dry, or attended with dark or red liquid sputa; when, along with a sense of suffocation and great anxiety, the countenance and lips become livid, and the pulse soft, irregular, and labouring; and finally, when delirium, coma, or convulsions supervene, or a sense of coldness is felt in the interior of the body, whilst the surface is very warm, the danger is to be considered as very great. A rattling respiration, accompanied with lividity of the countenance, and a constant effort by the patient, to bare the breast and to raise his head and shoulders from the bed, are almost certainly fatal indications.† The supervention of diarrhœa, in this disease, is a very unfavourable circumstance.‡ The prognosis in pneumonia, is nevertheless attended with considerable uncertainty. Instances of unexpected recovery occur, after the most dangerous symptoms have made their appearance; and, on the other hand, death sometimes speedily supervenes, in cases apparently free from particular danger.§

Treatment.—Both in pleuritic and peripneumonic inflammation, *bleeding* is the first and most important remediate means. The extent to which it is to be carried must be entirely regulated by the degree and obstinacy of the pain, and the state of the pulse. In pleurisy, we are generally obliged to abstract more

* Med. Chir. Rev. October, 1826, p. 514.

† Richter, Specielle Therapie. band. i. p. 415. Baglivi Opera. p. 42.

‡ Baglivi Opera. p. 35. Riverius, Praxis Medica, tom. i. p. 72.

§ Plus una vice vidi læta morbi facie, et ægroto atque adstantibus sibi gratulantibus, ex pneumonia subito mortem accidisse. At non raro etiam contrarium observavi: rebus ferme conclamatis et ægroto ad stygis confinia posito, prudenti atque audaci medicatione cum e manibus libitinæ evacisse.—*Schmidtmann, Ob. Med.* tom. i. p. 25.

blood than in peripneumonia, before the arterial reaction is sufficiently moderated. Whether the pleura or the proper substance of the lungs be the seat of the inflammation, however, a sufficient quantity of blood should be drawn at once, to make a very manifest impression on the pulse. The blood should be suffered to flow without any regard to mere quantity, until a diminution of the pain and oppression in the chest, as well as of the action of the pulse, ensues. If the action of the pulse and the pain increase again, more blood must be drawn, and again to the extent of producing a decided impression on the system. *The blood should be drawn in a full stream from a large orifice.* In *pleurisy* it is sometimes necessary to repeat the venesection three or four times in the course of the first twenty-four hours, before the violence of the disease is broken down. More caution, however, is necessary in the employment of the lancet in *peripneumonic* inflammation. Here, although prompt and very efficient blood-letting is decidedly beneficial, and without the least risk in the *commencement* of the disease, yet it is necessary to proceed with caution in the repetition of this measure, as the disease advances, lest dangerous prostration be induced. In violent attacks of peripneumony, the pulse is sometimes small, frequent, oppressed, and but slightly tense from the beginning of the disease. This state of the pulse may be owing to an oppressed or congested condition of the heart and large internal veinous trunks; but it depends also, occasionally, on an impaired state of the vital powers, particularly in what has been called nervous, or typhoid pneumonia. In such cases a vein should be opened; and if the pulse rises while the blood is flowing, we may proceed with confidence in the further abstraction of blood. Should the pulse become still weaker, however, the bleeding must be immediately stopped. Richter observes, that where the pulse is small in the commencement of peripneumony, the physician should place his fingers on the artery, and request the patient to make two or three strong inspirations, or to excite him to cough, by causing him to inhale the fumes of vinegar. If, by these exertions, the pulse becomes fuller and more active, we may be assured, he says, that there is still sufficient energy in the heart and arteries to justify the abstraction of blood.* The blood drawn in these affections exhibits a thick, sizy, or buffy coat, on the surface of a more or less *cupped* coagulum; and so long as the blood exhibits this appearance, bleeding may be regarded as a proper measure. The disappearance of the buffy coat is not, however, to be considered as a certain indication that blood-letting is no longer proper; for where the action of the pulse, and the degree of pain in the chest, are such as to in-

* Specielle Therapie. band. i. p. 418.

dicate the propriety of further abstractions of blood, bleeding may be confidently employed, notwithstanding the absence of the buffy coat on the drawn blood. "Some practitioners," says Dr. Millar, "have directed blood to be drawn, till the sizy crust which generally covers its surface, disappears. But this rule is extremely equivocal: in some, the blood puts on this appearance at the beginning; in others, not till towards the decline of the disease, and sometimes, no crust is observed through the whole course of the disease. The only certain indication, therefore, arises from the mitigation or violence of the symptoms." Local bleeding by *leeches*, seldom procures any particular advantages in the early periods of these affections, beyond that which arises from its general depleting effects. After the disease has been in a great measure subdued, and venesection is no longer indicated, leeching may no doubt be occasionally beneficial. In this case, small and repeated doses of digitalis, also, sometimes contribute materially to the further reduction of the general and local inflammatory action. A half a grain, in union with six or eight grains of nitre, may be given every three hours, until its effects on the pulse or stomach are manifested.

Although gentle aperients are decidedly beneficial in pneumonic inflammation, yet general experience goes to show that active and repeated purging is much more apt to prove prejudicial than useful. This is more particularly apt to be the case after free expectoration has been established. Before the complete establishment of the expectoration, Dr. Johnson states, that he has known purgatives very beneficial in common pulmonic inflammation. Dr. O'Halloran also employed active purges with advantage in pneumonia, among the British troops at Gibraltar. (Med. Repos. No. 8.) Nevertheless, as a general rule, active catharsis may be regarded as improper, unless, perhaps, in the very commencement of the disease. Small doses of one of the purgative neutral salts, or of castor oil, may be given, from time to time, so as to keep up a regular but moderate action of the bowels; or laxative enemata may be used with advantage for this purpose.

Emetics are equally improper in pleurisy and in peripneumony; but in *bilious pneumonia*, they may be accounted as among our most useful curative means. Richter states, that in this variety of the disease, emetics will often remove the pain in the chest as by a charm; and Stoll makes the same observation. (Ratio. Meden. tom. i.) In the few cases of this modification of pneumonia in which I have prescribed, I have had the most satisfactory evidence of the utility of emetics in its treatment. They generally bring on a uniform diaphoresis, promote expectoration, and allay the pain in the thorax, often almost imme-

diately. They usually bring up an abundance of bilious fluid from the stomach.

Cooling diaphoretics are very useful auxiliary remedies in these affections. Nitrate of potash with minute portions of antimony, the pulvis antimonialis, and the *muriate of ammonia*, are the best articles of this kind in the present disease. Richter particularly recommends the last mentioned article in the treatment of inflammatory pectoral affections; and my own experience coincides entirely with his observations concerning its usefulness. It may be given according to the formula mentioned under the head of *intermitting fever*.

With a view both of diminishing the action of the heart and arteries, and of promoting expectoration, *nauseating* doses of tartar emetic are generally highly useful. In Italy, large doses of this article are almost exclusively relied on in the treatment of pneumonic inflammation. Rassori and his followers make this the principal, and, in some instances, almost the sole remedy. They exhibit it to the extent of from a scruple to several drachms in twenty-four hours; and they assert that when given thus freely, it seldom excites either vomiting or strong purging, but always a most decided sedative or contra-stimulant impression on the sanguiferous system. M. Laennec speaks strongly in favour of large doses of this antimonial in acute pulmonary affections. He asserts, that in cases treated solely by bleeding, the pulmonary engorgement, discoverable by the *stethoscope*, continues much longer than in cases that are treated with large doses of tartar emetic. He thinks, that given to the extent of from twelve to twenty grains during the day, this article acts specifically in subduing inflammation, and powerfully promotes absorption.* Dr. Fontanelles, of Milan,† whose experience confirms the observations of Rassori on this subject, observes, that the power to sustain large doses of tartar emetic, depends wholly on the system being in a morbid condition; for when in a healthy state, or after the disease is removed, the ability of taking large doses of this medicine without injurious consequences, does not exist. It would seem, moreover, that the power of bearing large doses of antimony in peripneumony, varies in the different stages of the disease. It is greatest at the acme of the disease—being less prominent in the beginning and in the decline of the inflammation. Dr. Fontanelles generally gives about twelve grains per day in the first stage of the inflammation; but after the disease has advanced to its acme, from a scruple to half a drachm are administered in the same period. If the medicine produce active vomiting, the dose must be diminished; but so long as the

* Revue Médicale, Mai, 1824—Hospital Reports from La Charité.
† *Archives Générales*, February, 1824.

power of bearing it without great nausea or vomiting continues, the dose should not be lessened, although the symptoms of the disease may be declining.

Many practitioners have strongly recommended the employment of *calomel* and *opium* in peripneumonic inflammation; and my own experience has furnished me with repeated examples of the utility of this practice.* After the disease has continued for three or four days, and the action of the heart and arteries has been duly moderated by depletion, opium often does much good by allaying the pain and cough, and powerfully promoting a salutary expectoration. There is nothing to be apprehended from its stimulating effects. When given in combination with minute doses of tartar emetic, or with calomel, after adequate abstractions of blood, this article has a more decided tendency to increase the expectoration and complete the resolution of the disease, than perhaps any other internal remedy we possess. When the pain and cough continue to be troublesome after venesection has been efficiently practised, a grain of opium in union with two grains of calomel, given every three or four hours, will seldom fail to bring great and permanent relief. Where, however, the expectoration is free, and of a proper consistence, opium, if it be at all used, should be given in much smaller doses. One-fourth of a grain of this narcotic, with one-tenth of a grain of tartar emetic, or two or three grains of pulv. doveri. may, under such circumstances, be given every four or five hours. In pneumonic inflammation from metastasis of rheumatism or gout, this article is especially beneficial. In such cases it ought to be given in large and frequent doses—two grains with the same quantity of calomel every two or three hours, until the system is completely under its influence. Richter states, that when pneumonia is the consequence of repelled cutaneous eruptions, of measles, scarlatina, or of irregular gout, *camphor*, given in combination with ipecacuanha and opium, is, in general, a highly useful remedy. After blood has been decisively abstracted, one grain of camphor in union with the same quantity of opium and two grains of *ipecacuanha*, will often, he says, remove the pain and cough as by enchantment. If the pain returns, the dose must be repeated.

Expectorants may be employed with advantage after the

* Methodi Hamiltonianæ commendatio ab illustri Sam. Gottl. Vogel,(*a*) cujus auctoritatem tanti semper feci, me movit eam tentare; et tentando edoctus sum, ejus inventum et vulgationem magnum praxeos medicæ esse incrementum. Prima pericula omnem longe superabant expectationem meam; quare viginti abhinc annis et ultra non facile morbus inflammatorius mihi obvenit;—et multi centeni mihi obvenere—cui *opium* et *calomel* faustissimo cum successu non opposuissem. —*Schmidtmann, Sum. Obser. Medicar.* tom. i. p. 27.

(*a*) Handbuch der Pract. Arzneywissenshaft, 4 ter. theil. s. 25. u. 231.

violence of the inflammation has been reduced by blood-letting; but the benefit to be derived from this class of remedies is, upon the whole, much less considerable than might be inferred from the known salutary influence of a free expectoration in this affection. In the early or active stage of the disease, all articles of this kind, with the exception of tartar emetic, *kermes mineral,** or mucilaginous fluids, are liable to do mischief. When the violence of the disease has been moderated, and the inflammation is about terminating in resolution, opium with tartar emetic, as has just been mentioned, will, in general, assist materially in establishing the expectoration. An infusion of the *rad. polygal.* sweetened with honey, may be beneficially given during convalescence from pneumonic inflammation. The patient should be allowed the free use of demulcent drinks—such as barley-water, flaxseed tea, or a solution of gum arabic, to which honey or currant jelly may be added.

Blisters are among our most valuable means for subduing pneumonic diseases. As soon as the firmness and activity of the pulse have been reduced, a large vesicatory should be applied over the region of the affected part. Baglivi observes, that in some instances of pleurisy, great difficulty of breathing and suppression of the expectoration occur about the fifth or sixth day. In such cases, two blisters, he says, applied to the inside of the thighs, will generally produce a favourable change in all the symptoms. Triller recommends the same practice.†

In protracted cases of pleuritic inflammation, where symptoms of effusion are present, a combination of calomel, digitalis, and squills, has been found particularly serviceable.‡ I have found the diuretic mentioned under the head of chronic peritonitis, very useful under circumstances of this kind.—(See page 238.)

In cases that terminate in empyema, *paracentesis thoracis* is recommended; and we are not without a considerable number of examples of the successful performance of this operation, both in empyema and vomica. Dr. Samuel Calhoun, in his edition of Gregory's Practice of Medicine, states, that "he has known a case in which this operation had the happiest effect, though the opening into the cavity of the abscess was deep, and

* ℞. Kermes mineral. gr. xv.
Extract. glycyrrh. ʒii.
Aq. fontanæ ℥vii.
Syrup Scillæ ʒiii.
M. S. Take a table-spoonful every two hours.

† De Pleuritide, p. 48.

‡ ℞. Calomel ℈i.
Pulv. scillæ ℈ii.
—— digitalis ℈i.
Conserv. rosar. q. s. M.—Divide into twenty pills. S. Take one three times daily.

penetrated far into the lungs." For similar instances of successful *paracentesis thoracis*, the reader is referred to the works of Werlhof,* Donald Monroe, Stoll,† Richter,‡ Hoffman,§ B. Bell, and Aug. Gott. Richter.‖ M. Jowett has reported a very interesting case of empyema successfully treated by this operation;¶ and we might go on to cite many more instances of this kind. I have been thus particular in referring to authorities in favour of this operation in cases of empyema or thoracic effusion, from the equivocal manner with which it is spoken of by Dr. Gregory in his practice. "*Paracentesis thoracis*, he says, is *probably* advisable in *certain* cases both of vomica and empyema; but the observations of authors on this piece of practice are very scanty."**

When there is reason to believe that hepatization of a portion of the lungs has taken place, benefit may still be obtained, in some instances, from external irritating applications. Frictions with tartar emetic ointment, or with an ointment made by mixing two drachms of the white precipitate with an ounce and a half of lard, will answer well for this purpose. Setons, and caustic issues, also, are useful in cases of this kind; or continued blistering with *emplast. lyttæ*. Internally, advantage may probably be derived from small doses of muriate of mercury in union with conium or belladonna. One-tenth of a grain of this mercurial, with from two to three grains of the extract of conium, may be given three times daily. Diuretics, also, have been recommended

* Opera. Hanov. 1775, p. 775.

† Ratio Medendi, vol. iii. p. 155.

‡ Chirurgische Bibliotheck, band. 3. s. 464. Band. 4. s. 476. Band. 6. s. 590. Band. 7. s. 311. Band. 8. s. 728.

§ Unterricht von dem Collegium der Aerzte in Munster.

‖ Medico-Chirurg. Observations.

¶ Med. Chir. Rev., July, 1826, M. Jowett observes, "I have twice very recently had occasion to resort to paracentesis of the thorax, in hopeless cases of effusion arising from pleurisy. In both instances, the operation was the means of prolonging, although it did not eventually save the lives of the individuals."

To prevent the admission of air into the cavity, M. Jowett recommends the operation to be performed in the following manner: "Having made a small incision through the integuments only, in the place selected for the operation—which will, most commonly, be in the back, in the sixth or seventh intercostal space—thrust a *small* trocar carefully through the muscles and costal pleura; having withdrawn the trocar and left the cannula in the wound, join a tube, connected with a Reid or Weiss' syringe to the cannula, and slowly abstract the fluid by the syringe, continuing to work it as long as the piston moves freely, or until symptoms come on which render it necessary to desist. Then remove the cannula from the wound without previously separating it from the syringe; approximate the edges of the integuments by plasters, and apply a compress to make it more secure."

** "The history of the operation of paracentesis thoracis for *empyema* or hydrothorax, would well deserve an article in a periodical journal. Kurt Sprengel has given a most erudite history of this operation, from the days of Hippocrates to the close of the last century, occupying eighty-seven pages of letter-press." —*Dr. Johnson, Med. Chir. Rev.* vol. v. p. 273.

both in hepatization and in suppuration of the pulmonary tissue —more especially in thoracic effusion. When suppuration has occurred, the strength of the system should be supported by digestible and nutritious diet, opium, or extract of conium,—but the more diffusible stimulants must be avoided.

Sect. II.—*Cynanche Laryngea.—Laryngitis.*

Until within a comparatively recent period, *laryngitis* was generally confounded with croup, to which indeed it bears a considerable resemblance. Boerhaave refers to this disease in the 802 section of his aphorisms, and Van Swieten quotes a strongly marked case from Tulpius.* More recently, Drs. Farr, E. Percival and Home,† have published interesting papers on the pathology and treatment of this severe and dangerous variety of cynanche; and the chapter on this subject in Dr. Armstrong's work on typhus, may be advantageously consulted.

The disease usually commences with the ordinary initial symptoms of inflammatory fever; the patient experiencing at first slight sensations of chilliness alternating with flushes of heat. A feeling of soreness in the fauces, attended with more or less tenderness to pressure in the larynx, and uneasiness in swallowing, are among the first symptoms. The voice soon becomes changed into a thick, slightly hoarse whisper, and on strong inspiration, the air seems to enter impededly, as if it were forced through a very narrow aperture, and is attended with a hoarse, dull, hollow sound. On examining the fauces, they exhibit a pale red, tumefied, and œdematous appearance. The expectoration is not abundant, and consists almost wholly of saliva of a ropy character. The pulse is generally frequent, contracted, and tense; but in some cases it is but very little disturbed. The face is for the most part pale, and the tongue white, punctuated with red points, and covered with a layer of transparent mucus. When the disease is fully developed, deglutition is very difficult and painful, and apt to excite alarming and distressing paroxysms of suffocative breathing. The temperature of the surface is unequal, being higher than natural in some parts, and lower in others. One of the most peculiar and characteristic symptoms of this affection, says Dr. Armstrong, is the inability of patients to cough out, as is done in pulmonic or catarrhal affections; the attempt to do so resulting in a kind of suffocating effort, terminating "in a low, grumbling, and almost grunting sort of noise in the throat." Respiration, somewhat impeded from the onset of the disease, becomes more and more oppressed and laborious as the disease

* Observ. Medicar. lib. i. cap. 57, p. 96.
† Medico-Chirurg. Transact. vol. iii. p. 268.

advances, with occasional violent and distressing paroxysms of dyspnœa, until at last, in unsubdued cases, death occurs by actual suffocation.

In some instances, laryngitis is as insidious in its approach, as it is rapid and fatal in its progress. Mr. Porter knew two instances of young men who went to bed at night without complaining of any illness, "and were found dead from this affection the next morning." M. Leveille has reported a case of laryngo-bronchitis, which was so masked by erysipelas of the face, as to escape observation until within a few hours of its fatal termination.*

"The seat of this affection," says Mr. Porter, "is more in the cellular tissue, connecting the mucous membrane with the adjacent parts, than in the membrane itself, although this latter structure is very frequently found to have been inflamed." The epiglottis, rimaglottis, soft palate, and larynx, are always tumefied and œdematous by inflammation and serous effusion into the submucous cellular tissue, so as to approximate the sides of the glottis and prevent the passage of air into the lungs. In some instances the inflammation is confined to the larynx, but it occasionally is found to have extended down the trachea and even into the bronchia. (Armstrong.) Porter, however, observes, "I can find no satisfactory examples of the inflammation having extended beyond the larynx and into the trachea; on the contrary, the chief intensity of the disease has been in the epiglottis, which is found red, erect, thickened, and swollen, and during life resembles a piece of raw meat."† In the case reported by Leveille, the inflammation was manifest from the larynx down along the trachea and in the bronchia.

The inflammation has been known to terminate in the formation of one or more abscesses in the parts surrounding the larynx. Armstrong mentions a fatal case in an old woman, in which "a considerable abscess was found between the muscles of the pharynx and the bodies of the cervical vertebræ." In some instances false membrane is found on the epiglottis, tonsils, and trachea.

Treatment.—Laryngitis is to be regarded as one of the most rapid and dangerous affections. It often terminates fatally in less than twenty hours, under the most prompt, energetic, and judicious modes of treatment. *Blood-letting* is unequivocally indicated, and yet its effects in arresting the progress of the inflammation in this affection do not appear to equal those it manifests in other varieties of tracheal inflammation. Dr. Arm-

* Gazette de Santé, 1827.

† Observations on the Surgical Pathology of the Larynx and Trachea, &c. By Wm. Henry Porter, p. 98.

strong asserts, that in one instance, "one hundred and sixty ounces of blood were drawn within the space of six hours," by venesection and leeches, yet "so far from arresting the inflammation, the patient died within twenty-four hours." In only one case out of six, he says, did blood-letting appear to afford unequivocal advantage. It must be admitted, indeed, that bleeding does not often procure any prominent benefit in this affection; and yet who would undertake to treat the disease without resorting to prompt and efficient depletion? Dr. Beck of New-York attributes the want of success of this measure in laryngitis, to the inefficient manner in which it is usually employed. When carried to the extent of producing syncope, it is, he thinks, as likely to do good in this, as in other inflammatory affections of the respiratory passages. My own experience does not, however, entirely confirm this observation. Nevertheless, blood-letting to the *extent of producing fainting* must be regarded as an indispensable auxiliary in the treatment of this affection. Leeches should be largely applied to the throat. Martinet has reported a case which terminated successfully under the employment of general and local bleeding and blistering. In the course of three days upwards of 40 ounces of blood were drawn with the lancet, and 110 leeches applied to the throat and back of the neck. *Blistering* the throat or the back of the neck, while leeches and emollient poultices are applied to the throat, will in general assist materially in the reduction of the disease. Armstrong places more reliance on the repeated employment of antimonial emetics in this disease, than on any other remediate measure. After having found blood-letting and local applications ineffectual in the majority of cases that had come under his care, he was induced to try the effects of emetics, "given in repeated doses, till free and frequent vomiting was produced." He accordingly gave antimonial emetics in five cases, for which he was subsequently called to prescribe. "No circumstance in my professional life," he says, "ever gratified me more than the great and sudden relief which vomiting afforded; in reality it removed all the urgent symptoms at the time, and being re-excited as soon as ever the slightest signs of stricture in the larynx returned, at last completed the recovery." In a well marked case which I recently attended, in a child about four years old, blood-letting to the extent of about ten ounces, with a blister to the throat, and three active emetics, effected a cure. *Purgatives* must not be neglected in the management of this affection. Calomel either by itself in large doses, or in union with rhubarb or jalap, should be given so as to keep up a free action of the bowels. Some advantage may perhaps be derived from warm and stimulating applications to the feet, such as warm pediluvium or sinapisms. Dr. Good recommends the use "of gargles of ice-

water acidulated, and epithems of pounded ice applied externally," in preference to blisters to the throat. I have seen an instance of this disease in which the application of a solution of lunar caustic, by means of a soft pencil, to the inflamed fauces, (as is recommended by Mackenzie in the somewhat similar affection, recently described by Bretonneau, under the name of *diptherite,*) was evidently beneficial.

It is probable, that the insufflation of very finely powdered alum into the fauces, (a practice successfully adopted by Laennec in cynanche trachealis) would prove beneficial in this affection. The powdered alum may be blown into the fauces through a small tube or quill.

The operation of bronchotomy is recommended by some writers, where the remedies already mentioned do not make any effectual impression on the disease. "Besides the uncertainty that must prevail, as to the precise nature of the morbid action that is going on in acute laryngitis, and the consequent hazard a practitioner will run of losing his patient, whilst he is attempting a treatment that may be unsuccessful, there are many reasons why he should in the present instance decide at once on the performance of bronchotomy. Thus it allows the organ in which the diseased action is situated, to remain in a perfect state of repose. Considered as a wound, it adds nothing to the patient's danger; and as the relief it affords is, at least for a time, complete, it imparts confidence to the surgeon, and allows him more leisure to examine the symptoms and adapt the remedies accordingly. If, however, the operation be not early performed, it had much better be let alone altogether."*

A highly interesting instance is related of the successful performance of tracheotomy, in a case of laryngitis, by Dr. Crampton, in the fourth volume of the Dublin Transactions. Professor Regnoli, also, has reported two successful instances of this operation in *chronic* laryngitis. The acute form of the disease, he observes, sometimes terminates in chronic œdematous tumefaction of the epiglottis, and the mucous membrane of the larynx, with or without thickening of the submucous cellular tissue, which will ultimately render respiration extremely difficult, and even cause death by suffocation. Here bronchotomy is the only means of relief in our power.†

Sect. III.—*Cynanche Trachealis.—Croup, Hives.*

Symptoms.—This disease sometimes comes on suddenly, and acquires the utmost degree of violence in the course of a few

* W. H. Porter. Loc. Citat. p. 100.

† Nuovo Mercurio delle Scienze Mediche. Mazo, 1829.—*See Rev. Medicale, Juin,* 1829.

hours. More commonly, however, its approach is gradual, the first symptoms being those of ordinary pulmonary catarrh. A dry and hoarse cough, with slight difficulty of breathing, and a change of the voice, are generally the first intimations of its invasion. This very peculiar hoarse and rough cough, with its accompanying slightly oppressed breathing, continues sometimes, with occasional remissions, for several days before the disease assumes its characteristic form and violence. More or less febrile excitement is generally present from the very commencement of the disease. Sooner or later the respiration becomes more difficult and distressing; the febrile reaction rises higher; the voice becomes more indistinct, whispering, or annulled; slight pain and uneasiness is felt in the larynx; and the cough becomes more sonorous. The disease now advances rapidly to its state of full development, and all the symptoms acquire a most alarming and distressing degree of violence. The countenance is flushed; the eyes prominent, injected, and heavy; the pulse frequent, tense, and quick; the skin dry and hot; and the respiration extremely difficult and anxious. *Inspiration* is especially difficult, and accompanied with a very peculiar ringing or stridulous sound. The cough at this time is often quite dry; but in some instances there is a copious and very tenacious albumenoid fluid secreted in the larynx and trachea from the very onset of the disease; and in all cases this viscid secretion occurs in the advanced stage of the malady. If the disease be not checked in its violence and progress, the breathing acquires at last a degree of oppression inexpressibly distressing; the little patient manifests, in the expression of its countenance and actions, the utmost degree of anguish and suffering; the head is thrown backwards, and the mouth kept open; the eyes are half closed or cast about with an imploring expression for relief; the voice is extinct; the lips livid; the face pale and covered with large drops of sweat; sensibility rapidly diminishes; slight coma ensues; the extremities become cold and clammy; and finally breathing stops and closes the agonizing scene.

Such are the ordinary course and symptoms of this frightful malady. Much diversity, however, occurs in relation to the degree of violence and rapidity of these phenomena. In some instances, not more than a few hours elapse between the commencement and fatal termination of the disease. In other cases the symptoms proceed slowly to their acme, and the disease is protracted for many days, and occasionally even for several weeks, assuming a chronic character, without, perhaps, having at any time manifested a very alarming degree of violence. The ordinary period occupied by this disease is from two to five days.

Causes—Cynanche trachealis is one of those inflammatory

affections for which a predisposition appears not unfrequently to be congenital. It is certain, at least, that the children of some families are particularly predisposed to the disease, whilst in others it never makes its appearance. In what this predisposition consists, we cannot tell. To say that it depends on a peculiarity of the organization of the mucous membrane of the larynx and trachea, may be correct; but what these organic peculiarities are, it would be in vain to inquire. Besides this original or natural predisposition, there is another one much more universal and influential in its agency, namely, *age*. Cynanche trachealis is, indeed, almost peculiar to the age of childhood, being vastly more common in children between the first and fifth year of age, than in the whole subsequent and anterior periods of life. It is, nevertheless, not wholly confined to the years of infancy and childhood; for occasionally, though rarely, it occurs in adults, and sometimes even in very advanced age. This aptitude to the disease in early childhood, may depend, in part, on the peculiar condition of the glottis or larynx at this age; for that there exists some peculiarity in this portion of the respiratory passage during infancy and childhood, unconnected probably with mere size of aperture, is manifest from the characteristic voice at this early period, and its remarkable change during the period of pubescence. But there is another circumstance which may have a large share in the so common occurrence of this malady during infancy, namely, the almost universal custom of dressing children so as to keep the neck and upper part of the thorax perfectly bare, and thus rendering them more liable to the injurious influence of cold in these parts. Certain exanthematous affections also, often give rise to an increased aptitude for this disease. This is especially the case with scarlatina, measles, and milliary fever. Observation would seem to show that florid, robust, and fat children, are much more liable to the disease than those who are of an opposite habit.

The principal *exciting* cause of this disease is cold or sudden vicissitudes of atmospheric temperature; and hence its greater prevalence during the variable, damp, and cold months of autumn and spring, than in the more temperate and uniform season of summer. Cynanche trachealis is said to have prevailed epidemically; but contrary to what obtains in this respect with epidemic catarrh, these epidemic cynanche are always of a very limited sphere with regard to the extent of country which they embrace. In general this disease is most apt to prevail after, or during the prevalence of measles or scarlatina. During convalescence from these affections, there exists an especial aptitude to cynanche from the influence of cold. It would seem, too, that the liability to this disease is often considerably increased by having suffered an attack of it. I have known the same indivi-

dual suffer five or six attacks of the disease, during the period of childhood.

Cynanche trachealis is a phlegmasial disease, consisting essentially of inflammation of the mucous membrane of the superior portion of the respiratory tube. The correctness of this pathology is confirmed not only by the known character of its most common exciting cause, but especially, also, by the more direct evidence of the symptoms of the disease, and the appearances discovered on post mortem examination.

The observations of Bretonneau in France, and of Mackenzie in England, published within a few years past, go directly to the establishment of this view of the nature of the disease. Both these observers assert, that the inflammation often commences in the fauces and on the tonsils, and descends thence into the trachea; a progress of the disease which may be verified by ocular inspection. I have myself seen several cases of croup which commenced by a kind of erysipelatous or superficial inflammation about the tonsils and soft palate; and, in one instance, this inflammation continued for four days, and was the object of medical attention before it extended into the trachea and gave rise to the symptoms of croup.* The inflammation which occasions the characteristic phenomena of this disease, rarely remains confined to the larynx and trachea. In many instances, it extends downwards into the bronchia, and sometimes even into the small ramifications, giving rise to the simultaneous existence of acute bronchitis and laryngeal inflammation. The danger from this disease is always greater, *cæteris paribus*, in proportion as the inflammation passes down into the bronchial ramifications. Indeed, when bronchitis co-exists extensively, the result must almost inevitably prove unfortunate.

* It is surprising that a disease so manifestly *phlogistic* in its character, should still be viewed by some of the German and French writers as essentially spasmodic in its nature, or at least, as wholly independent either of a local or general inflammatory condition. Several of the late continental writers on this disease regard the fever and inflammation, which they acknowledge sometimes to exist, as wholly accidental, and as in no manner essential to the perfect constitution of the malady. Among the principal antiphlogistic pathologists in relation to this affection, may be mentioned Des-Essartz, Banafox,(*a*) Ruette,(*b*) Schenck,(*c*) Lobstein.(*d*) Professor Nasse regards impaired or disturbed function of the pneumo-gastric nerves as the proximate cause of this disease. The symptoms which characterize this disease, he asserts, bear a very strong resemblance to those which result from the division of the eighth pair of nerves. The inflammation which occurs in the mucous membrane of the respiratory passages, is, according to his views, secondary, and the consequence of the disordered function of the pneumo-gastric nerves.

(*a*) Jour. de Med. Chir. Pharm. &c. tom. xxxvii. November, 1816.
(*b*) Traité de l'Asphyxia connue sous le nom de Croup.
(*c*) Bib. Med. tom. xli. p. 256.
(*d*) Mem. de la Societé Med. d'Emulation 8º année iieº part. p. 538.

In some instances, the laryngo-tracheal inflammation terminates after a shorter or longer period from its commencement in the formation of a false membrane; which, according to the latest and most accurate observations, appears to consist of a concreted albumenoid secretion.* In other instances, the inflammation terminates in the secretion of a muco-purulent matter of an opaque and yellowish appearance, without the formation of a pseudo-membranous substance. There are other cases again, and these are perhaps much the most common, in which the inflammation produces neither false membrane nor a puruloid opaque matter, but an extremely copious secretion of a very viscid, limpid, and frothy mucus.† M. Blaud, in his excellent work on this disease, maintains that these different modes of termination constitute good grounds for dividing the disease into three principal varieties, indicating three different grades of inflammation. The inflammation is at the highest grade of violence in those cases which are attended with the formation of a false membrane. It is less violent in the instances where there is only a muco-purulent secretion formed; and in those cases in which a copious secretion of a tenacious, limpid, and frothy mucus occurs, the inflammation is at its lowest grade. In the first and most aggravated variety of the disease, the cough and respiration is always dry, or free from that peculiar rattling sound in the respiratory passages which occurs when these contain viscid secretions. This dryness of the cough usually continues for many hours after the disease is fully developed. The pain in the larynx is often very considerable, and the febrile reaction is usually particularly violent. The period at which the false membrane is formed, after the commencement of the inflammation, appears to vary considerably. In some cases, M. Blaud found the larynx and trachea lined with such a membranous substance, although the whole course of the disease did not occupy more than twenty hours; in other instances, several days appeared to elapse before it was formed. Occasionally, only a part of the internal surface of the larynx is found coated with this concretion; but in some instances, it has been found to extend into the bronchia, and even into its smaller divisions. Sometimes, instead of a membranous expansion, we find, on dissection, the upper part of the trachea almost entirely blocked up by a thick mass of the concreted albumenoid secretion lodged just within the glottis.

* According to the experiments of Schwilgué, this membranous substance is insoluble both in cold and in boiling water, but perfectly soluble in a solution of the alkalies. By incineration, it yields deuto-carbonate of sodium, proto-phosphate of lime, &c.; corresponding thus entirely with the properties of coagulated albumen.

† Nouvelles Recherches sur la Laryngo-Trachéite. Par P. Blaud. A Paris, 1824.

In cases in which this membranous substance is not formed, the cough early becomes somewhat humid, and the respiration rattling; and before the disease has continued many hours, the mucus in the larynx and trachea is so copious as to threaten suffocation by obstructing the glottis. M. Blaud thinks, that the extremely viscid mucus which is formed in these milder cases, is entirely different in its properties from the secretion which occurs in the former variety—and that it is incapable of being so inspissated as to give rise to a pseudo-membranous substance.

Whatever may be thought of M. Blaud's division of this disease, or of his sentiments in relation to the *radical* distinction between the inflammation and secretion which give rise to *membranous* structures, and that inflammation and its consequent *mucous* secretion which occurs in cases unattended with the formation of false membrane, it must be admitted that there exists at least a twofold diversity in relation to the immediate local consequences of the laryngo-tracheal inflammation—namely, one variety in which false membrane is formed, and in which the cough and respiration are at first dry, or do not indicate the existence of much mucus in the respiratory passages; and another variety in which the cough and respiration are humid, in the early period as well as throughout the disease, and in which a very copious secretion of transparent and extremely viscid mucus occurs. The former are exceedingly dangerous, nay, almost hopeless, unless subdued by the most prompt and powerful antiphlogistic measures in their very onset. The latter are much less dangerous, and may generally be cured by more moderate antiphlogistic measures, and the expulsion from time to time of the tenacious mucus from the larynx and trachea.

In nearly all cases, the mucous membrane of the larynx and trachea is found very manifestly congested on dissection; and the glottis is very frequently considerably narrowed by a kind of thickening or tumefaction of its lips.

With regard to the *ratio symptomatum*, it may be observed, that the immediate cause of the distressing difficulty of respiration, and finally of death, consists in an obstruction to the passage of the air into the lungs. The circumstances which cause the exclusion of the air from the lungs, consist either in a spasmodic closure of the glottis, or in an occlusion of this aperture by tumefaction of its sides, or by the formation of false membrane or a mass of concreted lymph, or finally, by an excessive quantity of a very ropy and viscid mucus closing up the passage. Death is also sometimes the immediate consequence of an effusion into, and consequent choking up of the bronchial cells, a mode of termination which almost always occurs when the inflammation descends into the bronchial ramifications. Spasmodic contrac-

tion and closure of the glottis may be caused by irritation excited by the upper portion of the false membrane.

Prognosis.—Laryngo-tracheitis is always to be regarded as a very dangerous affection. Formerly the majority of cases terminated fatally; but under the present improved pathology and mode of remediate management, the proportion of fatal cases is greatly diminished. Frightful and unmanageable as this disease is when suffered to pursue its course uncontrouled, or when opposed by inadequate means, it is, nevertheless, almost as much under the dominion of a prompt and vigorous antiphlogistic treatment as any of the more serious phlegmasial affections. The degree of danger appears to be proportionate to the violence of the inflammation, and the extent to which it may have passed downwards into the pulmonary passages. It would seem, also, that the more sudden the attack, when attended with strong febrile excitement, the greater in general is the danger. When, however, the disease supervenes suddenly without fever, the attack may be presumed to be purely *spasmodic*,* and may readily yield. The shriller and more sonorous the cough, the more reason is there to apprehend danger. It must be observed, however, that the prognosis in this disease is often exceedingly fallacious. Sometimes the symptoms yield, and promise a speedy convalescence, when a violent exacerbation will suddenly supervene and destroy the patient; and on the other hand, death may appear to be impending, when, on the sudden expulsion of a membrane, or even without such an occurrence, a rapid change for the better will ensue, and lead on to full convalescence.

Diagnosis.—There is but one disease which may be mistaken for laryngo-tracheitis, namely, *spasmodic*, or *cerebral* croup. From this latter form of disease it may be distinguished: by,

1. The attack of cynanche laryngo-trachealis, generally coming on *gradually*, with the ordinary initial symptoms of catarrhal affections; spasmodic croup always supervenes *suddenly*, and is rarely preceded by catarrhal symptoms. When the former *does* come on suddenly, which is sometimes the case, it is so manifestly a febrile affection, that by this circumstance alone it may be readily distinguished from the spasmodic disease.

2. Cynanche is essentially a febrile affection; spasmodic croup is free from fever, except it be accidentally present.

3. Cynanche is often attended with considerable *remissions*, but not with complete *intermissions*, except perhaps immediately after vomiting. Spasmodic croup is often marked by *complete intermissions* of considerable duration.

4. Cynanche is always attended with a hoarse and sonorous

* Under the head of Asthma, in the second volume, some observations are made on Spasmodic Croup.

cough, and frequently with a copious secretion of viscid mucus in the trachea. Spasmodic croup is rarely accompanied with much cough, frequently none at all, and it is always dry.*

5. The peculiar stridulous sound of the cough and inspiration, so characteristic of cynanche laryngo-trachealis, does not occur in spasmodic croup.

6. In spasmodic croup the pulse is small and contracted, and the skin not above the natural temperature. In cynanche the pulse is in an excited and irritated state, being generally full, frequent, quick, and tense, and the temperature of the surface is febrile, except towards the fatal conclusion of the disease, when, from the imperfect function of the respiration, animal heat ceases to be generated in its normal proportion.

Treatment.—From what has been said above, of the nature and character of this disease, it is obvious that the general indications to be kept in view in its remediate management are: 1. To subdue the local and general inflammatory action as speedily as possible; and, 2. to promote the discharge of the viscid and coagulable secretions which are lodged within the superior portions of the respiratory tube. For the fulfilment of the former of these indications, the most prompt and energetic antiphlogistic measures must be adopted. He who loses sight of, or neglects this all-important indication, and places his hopes in one or more of the empyrical remedies that have, by different practitioners, been extolled for their supposed specific tendency to counteract the tracheal affection, will, we may be confident, have but little reason to flatter himself for his success in the management of this malady.†

The remedy upon which we must place our principal reliance for the reduction of the tracheal inflammation is *blood-letting*, in conjunction with external vesicating or irritating applications to the throat. Here, however, as in most of the other phlegmasial diseases, the good effects of the lancet are confined to the early period of the disease. If bleeding be neglected, or inefficiently employed, in the first stage of the malady, its progress

* Dr. Rush has published an account of a dissection of a child that had died of spasmodic croup. In this subject, no membrane, nor even mucus was found in the respiratory passages, nor did the lungs exhibit the slightest traces of previous disease.

† It was owing to physicians not attending to the essentially inflammatory nature of this affection, and the consequent indispensableness of prompt and vigorous antiphlogistic measures, that this disease was formerly so much more frequently fatal than it appears now to be. It is also owing to this error, or rather to the erroneous views which have been so common concerning the pathology of this disease, that so many physicians have objected to the employment of blood-letting, and expressed their willingness to confide in *mercury*, *polygala senega*, *carbonate* of *ammonia*, and *hepar sulphuris*, to the exclusion of the direct and powerful antiphlogistic means, long since so universally and so successfully practised by American physicians.

will be extremely perilous, whatever other remediate measures may be adopted. When called to a patient labouring under this disease, in whom the manifestations of high febrile excitement and active tracheal inflammation are conspicuous, a vein should be opened, and the blood suffered to flow until an approach to syncope be induced. As soon as this effect is produced, all the distressing symptoms usually subside. If in the course of an hour or two the difficulty of respiration reappears, and the pulse be not soft and feeble, more blood should be drawn, and again to the extent of inducing an approach of syncope. I have been obliged to open a vein three or four times in the course of twelve hours, before a permanent and decisive impression was produced on the disease. Such copious depletion is, however, demanded only in cases where the local and general inflammatory action is strong—where the pulse is tense, hard, quick, and vigorous, attended with a dry and sonorous cough and respiration. Such cases are apt to terminate in the formation of a false membrane in the larynx; and our efforts ought to be prompt and vigorous to reduce the inflammation below the grade necessary for the formation of pseudo-membranous matter. After the effusion which gives rise to the membrane has taken place, bleeding will afford but moderate and temporary advantage.

It must also be observed, that where the disease is attended with but moderate symptoms of febrile excitement; where the pulse is not hard, or tense, though accelerated; and especially where, in addition to these manifestations of a moderate febrile excitement, the *cough and respiration are attended, early, with a copious, transparent, and viscid mucus*, blood-letting need very seldom be employed to the extent just mentioned, and may even, in some instances, be wholly dispensed with.*

Emetics are important remedies in this disease, and may, indeed, be regarded as indispensable in its remediate management. Assisted by warm pediluvium, mercurial purgatives, and rubefacients to the throat, I have frequently subdued mild attacks of the disease without the aid of direct depletion. In those cases that are early attended with a copious secretion of viscid mucus in the larynx and trachea, emetics are especially

* In no country is blood-letting so actively employed in this, as indeed in all other inflammatory affections, as in America. The value of this evacuation in the present disease has been long understood by American physicians, whilst in Europe it was, until lately, looked upon as an equivocal, if not an injurious measure. Even those who admitted the inflammatory nature of the disease, bled but very sparingly. To this there are indeed some remarkable exceptions. Ferriar recommends bleeding, *ad deliquium*. (*Med. Histories.*) "This," says he, "is the essential point, without which no relief can be effected." The same practice is strongly inculcated by Drs. Bayley and Middleton. (*Cases of Angina Trachealis, with the Cure, in Letters to William Hunter, M. D.* 1781.) And in the late medical journals, observations may be found equally favourable to decisive depletory measures in this formidable malady.

useful. They tend not only to expel this tough mucus from the larynx, and thus to give a temporary freedom from the dyspnœa; but also to equalize the circulation and to promote the cutaneous exhalation, as well as to diminish the general arterial excitement by the nausea which precedes and accompanies their operation. In *infants* affected with this disease, the occasional employment of an emetic is particularly important; for at this early age, no voluntary efforts are made, to dislodge and expel the viscid secretion from the larynx, and which, if not removed, may by itself cause suffocation. In those violent cases, which manifest a highly inflammatory character, and in which the cough and respiration *are dry* during the first stage, there is commonly but little advantage gained from the operation of an emetic, so long as this dryness of the larynx and trachea continues. In such cases, the proper period for the administration of emetics commences with the appearance of the viscid secretions, which always sooner or later occur in the respiratory passages, and from which the disease derives its most serious and dangerous character. Without doubt, from the general antiphlogistic tendency of nausea and emesis, some benefit may result from the exhibition of emetics before any morbid secretions occur in the larynx; but the peculiar advantages of this class of remedies are most assuredly more conspicuously displayed when the upper portions of the wind-pipe are clogged with a viscid fluid, which requires expulsion. In the advanced periods of the disease, there exists often so much torpor or insensibility of the system, in consequence of the imperfect decarbonization of the blood and vascular congestion in the brain, that great difficulty is experienced in procuring the operation of emetics. To obviate this gastric insensibility, and procure emesis, we must endeavour to diminish the sanguineous congestion in the head; and this may, in general, be readily accomplished by putting the patient's feet in warm water, and applying a napkin, wet with very cold water, to the head. The abstraction of blood, too, while the patient is supported in a sitting or erect posture, will rarely fail to ensure the operation of an emetic under the circumstances in question. The articles I prefer as an emetic in this disease are calomel in combination with tart. antim. I commonly administer from five to six grains of the former article with one-fourth of a grain of tart. antim. to a child of from two to five years old. I have frequently given from eight to ten grains of calomel alone, and have very generally found it to excite active vomiting in a short time. The peculiar advantages which appear to me to belong to this practice, are the protracted and great degree of nausea which the calomel produces, an effect which has a powerful antiphlogistic tendency; and the alvine evacuations which almost always speedily ensue. Besides these effects, great bene-

fit may be expected from the early constitutional influence of the calomel—an influence which, in the present disease, especially, is very generally acknowledged to be highly salutary. Be this as it may, universal experience decides in favour of the employment of emetics in this disease. Tart. antim., ipecacuanha, sulph. zinci, squills, sulp. cupri, have all been used and recommended in this affection, and where the object is merely the expulsion of the tracheal mucus, or pseudo-membranous matter, any of these articles may answer our purpose.* In some instances, where the accumulation of the tenacious secretion is very rapid, it becomes necessary to repeat the emetic three, four, or five times in the course of twenty-four hours.

M. Jadelot recommends the following mixture as an emetic in croup, after proper depletion has been practised :

℞. Infus. polygalæ ℥iv.
Syrup ipecac. ℥i.
Oxymel scillæ ℥iii.
Antimon. tart. gr. iss.
M. Take a spoonful every fifteen minutes, until vomiting is produced.

Purgatives are useful *auxiliary* remedies in the treatment of this disease. In the onset of the complaint, the bowels should be briskly evacuated, and two or three evacuations should be subsequently procured daily until the inflammation is subdued. After the first purge, which should be energetic, it is best to employ the gentler articles of this class of remedies; for very active catharsis tends to exhaust the resources of the system without procuring any peculiar advantages over milder aperients, and may even do harm. After the first cathartic, it will in general be sufficient to keep the bowels in a loose state by laxative enemata.

Calomel, given with a view to its constitutional influence, is a remedy which has been, and by many is still much extolled in the treatment of this disease. Many of the continental writers seem to look upon it as decidedly the most valuable means we possess for removing the local tracheal affection. In our own country, too, this article has found some eminent advocates as a remedy in inflammatory croup. The late Dr. Rush placed great reliance on its powers in this disease ; for he asserts, that when given in large doses in the commencement of this disease, and continued afterwards in smaller doses, "it is hardly less efficacious in this complaint than the Peruvian bark is in intermittents." Dr. Hosack also speaks very favourably of the employ-

* I have, in a few instances, prescribed an infusion of the lobelia inflata, with the happiest effect. From its known very powerful influence upon the respiratory function in asthma, independent of its emetic operation, there is some reason for presuming, that in relation to the present disease, it may possess peculiar virtues, and my limited experience with it inclines me to this opinion.

ment of calomel and James's powder in combination, given at short intervals in the second stage of the complaint; and the late Dr. Bard placed much reliance on its powers. That the constitutional influence of mercury is calculated to do good in croup, I am well persuaded from my own experience. It tends in no small degree to reduce the local laryngo-tracheal inflammation, and to counteract, as it would appear, the formation of the pseudo-membranous exudation. Its operation in this respect is, however, much too slow to afford particular advantage in the more acute and rapid cases of the disease, many of which run to a fatal termination in less than twenty-four hours. Where the complaint assumes somewhat of a chronic character, we ought not to lose the advantages which may be derived from this remedy. My usual mode of giving this article after the first or second emetic is to exhibit one grain every hour or two, with about one-fourth of a grain of ipecacuanha.

The *warm bath*, also, is a very useful auxiliary in the treatment of this disease. Employed along with the remedies already mentioned, its benefits are often very considerable, more especially where the skin is very dry and hot. Its usefulness is, however, confined to the early periods; for, in the advanced stages, the skin is generally bathed with profuse perspiration, and the pulse weak and soft.

Concomitantly with the preceding remediate measures, external rubefacient and vesicating applications to the throat ought, in all instances, to be employed. One of the first measures after bleeding should be the application of a blister, or some irritating substance to the throat of the patient. I prefer the application of the spirits of turpentine to blisters or any other similar article. The action of the turpentine on the skin is prompt and powerful, and if the derivative powers of such applications be proportionate to the degree of irritation and pain they produce, few articles can equal the present one in this respect. A piece of flannel may be imbued with the turpentine and applied round the neck. Children seldom will bear this application for more than twenty or thirty minutes at a time. It must, therefore, be removed and reapplied from time to time, according to the violence and permanency of its effects on the skin. In general, it has appeared to me that active rubefacients are preferable to blisters in this complaint. They generally act with promptitude and force—a circumstance of no small consideration in a disease which often runs its course in a few hours. A blister requires from four to five hours before its effects on the skin can be of any particular avail. An efficient blood-letting ought always to precede such applications in cases attended with high febrile excitement. The oil of the *monarda punctata*, with an equal proportion of camphorated liniment, forms also an excellent ru-

befacient in this affection. Where the disease proceeds slowly, the use of a blister will be preferable to rubefacients.

With regard to the local abstraction of blood by means of leeches, general experience does not enable us to ascribe any peculiar advantages to it. It has never yet appeared to me to afford any greater advantage than if the same quantity of blood had been drawn with the lancet.

Besides the foregoing remediate measures, which may be justly regarded as decidedly the most direct and powerful means for combating this malady, a number of other remedies have been recommended—some of which have been distinguished by the title of *specific*. Among these pretended specifics, the *polygala senega* and the *hepar sulphuris* (deuto-sulfure of potassium) have attracted the most attention. The former of these articles is, without doubt, a useful medicine in certain states of this disease; but it is, most assuredly, far from possessing the powers which were formerly ascribed to it by Archer and others. In the commencement of the disease, especially in the more violent cases, it is objectionable on account of its stimulating properties; but after the complaint has been in some degree subdued, or lost its acute inflammatory character, its influence is often conspicuously beneficial. For the removal of the dry and hoarse cough and slight oppression of the respiration, which in some instances remain after the inflammation has been subdued, we possess no remedy equal in usefulness to the polygala. It is, moreover, a decidedly useful remedy in all instances of chronic croupy affections, and in the catarrhal and pectoral affections which remain as the sequela of this and other acute affections of the respiratory organs. It is best given in decoction. An ounce of the root to a pint of boiling water suffered to simmer for 15 or 20 minutes, and afterwards sweetened with honey. The dose of this is about an ounce every hour or two, according to the urgency of the symptoms.

With regard to the *hepar sulphuris*, a remedy introduced to the notice of the profession about 16 years ago, in a prize essay on this disease presented to the French *Ecole de Médecine*,* little can now be said in commendation of its powers. Its introduction was founded on the erroneous doctrine that croup consists essentially in a morbid coagulability of the tracheal mucus, and which, it was asserted, the sulphuret of potash had the power of preventing or altering. It need scarcely be observed, however, that a remedy which might possess such power, without, at the same time, exerting any influence in subduing inflammation, could afford us but little advantage in this affection; and

* Rapport sur les ouvrages envoyées au concours sur le *croup*, par la commission chargée de l'examen et du jugement de ces ouvrages. Paris, 1812.

the result of later experience goes to show that this, at first highly lauded remedy, exerts no decided influence over the tracheal inflammation. It would be a waste of time, to pass in review the various other remedies of this kind, which have at times been praised, and again abandoned as curative means in this disease. As well might we look for specifics for the cure of pleurisy, phrenitis, or gastritis, as to expect to find one for laryngo-tracheitis.

It has already been stated above, that the exudation of albumenoid fluid, which forms the false membrane, frequently commences on the surface of the tonsils, and thence spreads along the arches of the palate, and at last descending, over the internal surface of the pharynx and œsophagus, as well as the larynx and trachea. According to the experience of Dr. Mackenzie, the application of a solution of the nitrate of silver to the tonsils, velum palati, and uvula, will in such cases frequently remove the membranous crust completely, and produce speedy and great relief, and ultimately entirely remove all the symptoms. The solution employed by him is of the strength of a scruple of the nitrate of silver to an ounce of distilled water. I have seen one instance in which this application was made, and the result gave me a very favourable impression of this practice. It must of course be confined to those cases in which the fauces are found, on inspection, to present an irritated and inflamed condition. Dr. Laennec has lately published a statement, from which it appears that insufflation of very finely powdered *alum* generally affords great and speedy relief, not only in this variety of the disease, but also in cynanche laryngea and tonsillaris. As cases of this kind are not uncommon, the practitioner ought in all instances to examine the fauces; and where the soft-palate and tonsils are found to be inflamed and œdematous, a local application of the kind just mentioned ought at once to be made. The success of the treatment, must depend materially on the prompt reduction of this primary extra-laryngeal inflammation.

With a view of expelling the false membrane, emetics have been recommended in the advanced period of the disease, and the records of medicine are not wanting in instances in which this object was effected by such a measure. It offers, however, but an exceedingly slender foundation to build any hopes upon. The same object has in one or two instances been obtained by exciting violent sneezing by blowing snuff into the nostrils through a small tube. As to the proposed operation of tracheotomy in order to detach and remove the membrane, all experience has so far decided against it.

Sect. IV.—*Acute Bronchitis.*

Peripneumonia Notha.

The pathological character of acute bronchitis is very closely allied to common catarrh ; and, in truth, the latter affection may be regarded as the lowest grade of mucous inflammation of the bronchia. (Hastings.) This form of pneumonic inflammation is most apt to attack old people and infants, or persons of phlegmatic and debilitated habits. It generally commences, like ordinary catarrh, with lassitude, chilliness, slight cough, and a sense of oppression and tightness about the præcordia. In many instances, the disease seems at first of no very serious character. The patient complains of little or no pain in the breast—a sense of weight and constriction in the thorax being the only uneasiness experienced in that part. In these cases, the febrile symptoms are but moderate. As the disease continues, the oppression at the præcordia increases ; the countenance becomes expressive of anxiety ; respiration becomes more and more laborious, and is attended with a wheezing or rattling sound, as if the air were forced through a narrow aperture clogged with a viscid fluid. In most instances, there is some degree of hoarseness. In the advanced period of the disease, respiration is much more difficult in the recumbent than in the erect position ; and hence patients generally desire to have the head and shoulders propped up with pillows. At first the cough is dry ; but a copious secretion of viscid transparent mucus, resembling the white of eggs, soon takes place, and with it considerable abatement of the violence of the cough occurs. So long as the sputa preserve this appearance, the disease may be regarded as unchecked in its violence ; but when the inflammation is about to terminate in resolution, the matter expectorated loses its transparency, "and becomes mixed with yellowish-white or greenish masses, which are scanty at first, but continue to increase more and more, until at last they compose the whole of the expectoration."* In nearly every instance of the disease, severe pain is felt across the forehead, which is always greatly aggravated by coughing. When the secretion of mucus into the bronchia is very copious, and respiration much obstructed, considerable drowsiness usually occurs. The tongue is white, and covered with transparent mucus ; the skin is dry, and its temperature generally but very little above the natural standard. The blood is, commonly, buffy, and sometimes cupped. Infants are especially liable to this affection. In them the disease manifests itself by a short, quick,

* Clinique Médicale, &c. Par G. Andral. Deuxième partie, p. 53.

oppressed, and wheezing respiration; uneasiness by being placed in the recumbent position; slight cough, somewhat hoarse at first, but humid and rattling as the disease advances; *a uniformly pale and anxious countenance;* pulse frequent and tense; skin above the natural temperature on the trunk—but the hands and feet are commonly cool, or about the regular temperature. Respiration varies greatly: occasionally it is easy and free—and then suddenly becomes alarmingly oppressed, threatening instant suffocation. The progress of the disease is usually rapid. If it be not arrested, the breathing becomes more and more oppressed; "the child falls into a comatose state; a slightly livid tinge makes its appearance on the lips, from which the pallid cheeks are not entirely free. But even at this late period, gleams of hope sometimes burst upon us. For a short time the difficulty of respiration may seem to subside, and the child to be better. But these hopes are very seldom realized; for even the next exacerbation may terminate in suffocation." The disease sometimes terminates fatally as early as the third day, though more commonly its course is protracted to the fifth or sixth day. Acute bronchitis is always attended with great muscular debility.

In robust plethoric subjects, the febrile reaction in the early period of its course is sometimes as vehement as in pleuritis. In cases of this kind, the inflammation generally passes to the substance of the lungs. Little or no pain, however, is felt in the breast; but the tightness and oppression are extremely distressing, and the breathing very laborious. Unless the inflammation be promptly subdued, effusion into the bronchial cells will take place; the lips become purple; the face and extremities cold; the pulse small, labouring, and obstructed; the breathing short and incomplete; and at last drowsiness, partial coma, and suffocation, close the scene.*

In some instances, acute bronchitis is complicated with *hepatic* disease; a complication which occurs, not unfrequently, in persons addicted to the intemperate use of spirituous liquors. (Hastings.) Cases of this kind, besides the pneumonic symptoms already mentioned, are attended with tenderness and fulness of the right hypochondrium, oppression in the præcordia, nausea, bitter taste, vertigo, headach, dark-coloured and very fetid alvine discharges; and in some instances symptoms of acute hepatic inflammation attend, more especially when the bronchitis occurs after measles. In children, cynanche trachealis often terminates fatally by the supervention of acute bronchitis.

Diagnosis.—The characteristic symptoms of acute bronchitis are: great oppression and tightness in the breast, with little or

* A Treatise on Inflammation of the Mucous Membrane of the Lungs. By B. C. Hastings.

no pain ; severe pain in the forehead, greatly aggravated on coughing ; a wheezing rattling respiration ; uneasiness in the recumbent position ; pallor of the countenance ; a very copious secretion of viscid, frothy, and transparent mucus in the bronchia ;* and generally a moderate grade of febrile excitement.

Post mortem appearances.—In very acute and rapid cases, the lungs do not collapse on opening the thorax, and its whole structure appears to be engorged with a frothy serous fluid. The mucous membrane is generally minutely injected—sometimes throughout its whole extent, and occasionally only in patches, the intermediate parts being nearly in a natural state. The smaller branches of the bronchia are usually filled with a tenacious mucus, bloody serum, or purulent matter. In acute bronchitis succeeding pustular exanthematous affections, minute ulcerations, with uniform redness of the mucous membrane, frequently occur. In many instances, the substance of the lungs exhibits a reddened, hepatized, suppurated, or tuberculated structure ; and occasionally even the pleura is found inflamed with incrustations of false membrane, or effusion into the cavity of the thorax.†

The wheezing respiration, and the great difficulty of breathing in this affection, are caused, no doubt, says Dr. Hastings, by the mechanical impediment to respiration from the redundant viscid mucus lodged in the smaller branches of the bronchial tubes ; and the severe headach arises probably from "the congestion of the pulmonary blood-vessels," interfering with the due return of blood from the head. Deficient decarbonization of the blood, would seem to be the cause of the great muscular prostration which always attends severe cases of this disease.

Although the phenomena just mentioned are very generally presented on dissection, I do not doubt that death sometimes occurs in consequence of the inflamed mucous membrane preventing the atmospheric air from producing the necessary change in the veinous blood. M. Andral Jr. has related some cases of mortal dyspnœa from bronchial inflammation, where no effusion had taken place, nor any lesion of the parenchymatous structure of the lungs. When the pulmonary mucous membrane is intensely inflamed, the necessary influence of the atmospheric air upon the blood, it may reasonably be presumed, will be more or less diminished ; for it can scarcely be doubted, that whether the oxygen enter into the blood-vessels, or the carbon be thrown out through the delicate mucous membrane, much impediment will be produced to this process, when this membrane is deeply

* M. Andral says, this mucus resembles the white of eggs, and is extremely tenacious. Its tenacity and viscidity increase in proportion as the irritation of the mucous membrane is more considerable.

† Hastings, Loc. Citat. p. 186.

inflamed and thickened. The dyspnœa occurring in the early stage of bronchitis, is, perhaps, mainly attributable to this cause, and not to the clogging of the bronchial cells by viscid mucus, as is generally supposed. Patients often die in this disease, it would seem, from asphyxia—the inflamed mucous membrane opposing the transit of the carbon from the blood to the bronchial cells, or of the oxygen of the air into the circulation.

The *prognosis* in this affection is generally attended with much uncertainty; for in cases which appear to be going on without any particular danger, a sudden exacerbation will sometimes occur, and speedily terminate the patient's life. Death, in this disease, is almost always preceded by more or less coma, and occurs, generally, from effusion taking place into the substance of the lungs and bronchial cells. A copious expectoration is always a favourable sign, in this as in the other varieties of pneumonic inflammation. The less thoracic oppression and dyspnœa there is, the greater will be the chance of recovery from this disease.

Treatment.—Much discrepancy of opinion has been expressed with regard to the value of blood-letting in this affection—some considering this evacuation as attended with much risk, on account of the great tendency to prostration and effusion into the lungs connected with the disease (Richter); whilst others rely, with much confidence, on prompt and decisive blood-letting. With proper discrimination, the abstraction of blood may be as beneficially resorted to in this, as in any other form of pneumonic inflammation. In the acute bronchitis of very old persons, or of worn out and debilitated habits, it is indeed necessary to proceed with much caution in the use of the lancet; but even in cases of this kind, moderate bleeeding soon after the commencement of the disease, will in most instances prove serviceable. In infants, when I have been called early, I have almost uniformly resorted to one very decisive bleeding; and generally, with unequivocal advantage. In the rapid and violent instances which occur in robust, vigorous and plethoric habits, prompt and very efficient bleeding is indispensable. In all cases, however, and particularly in the latter variety, the blood should be taken at an early period—as soon after the development of the inflammation as possible. If delayed until effusion or a copious secretion of bronchial mucus has taken place, the chance of benefit from it will be greatly diminished, and detriment probably be the consequence. So long as the cough is dry, we may draw blood, with a fair prospect of advantage; and a sufficient quantity ought to be taken away, at the first bleeding, to make a manifest impression on the action of the heart and arteries; for a repetition of it will seldom be borne more than once or twice.

Cathartics are recommended by some writers, but, except in

the very commencement of the complaint, they are of doubtful propriety. The bowels should be kept in a loose state by laxative enemata, or the exhibition of the milder aperients, such as castor oil, or small portions of one of the laxative neutral salts. When, however, the disease is complicated with abdominal disease, cathartics may be freely employed with much advantage.

Emetics are generally recommended as among the most useful remedies in this affection. They usually procure immediate relief of the oppression in the chest and dyspnœa; and are apt to excite general diaphoresis, as well as more free expectoration. In the bronchitis of infants, they are especially serviceable, by expelling the viscid mucus which clogs the bronchial cells, and thus facilitating respiration, and, thereby, sustaining the powers of the system. Hastings observes, that an aqueous solution of tartar emetic is the best medicine for this purpose in adults; and ipecacuanha in children. I have generally preferred using a mixture of vinum antimonii and syrup of squills, in children labouring under this complaint. From 15 to 20 drops of the former, with half a tea-spoonful of the latter, may be given every twenty minutes, to a child from one to three or four years of age, until vomiting is produced.

Expectorants also are useful remedies in this affection. In the early period of the disease, mucilaginous mixtures, or antimonials, should be employed for this purpose. Thus,

℞. Tart. Antimonii gr. ii.
Sal. tartar. ʒvi.
Aq. fontanæ ℥iiss.
Mel. optim. ℥iiss.
M. S. A table-spoonful every hour for an adult.

But after the general arterial excitement has been moderated, we may resort with much advantage to the stimulating expectorants.

℞. G. ammoniæ ʒi.
Infusio. polygal. seneg. ℥viii.
Oxymel. Scill. ℥i.
M. ft. S. A table-spoonful every two hours for an adult.

When the pulse becomes very small and weak, some of the more active stimulants should be exhibited along with expectorants. For this purpose, camphor and the carbonate of *ammonia* are valuable. I have used the following mixtures with much benefit in cases of this kind:

℞. Pul. camph. ℈ii.
——g. arab. ʒii.
Syrup Scillæ ℥i.

Triturate them in a mortar, then gradually add,

Aq. fontanæ ℥vi.
Tinct. opii g. lx.
M. S. Take a table-spoonful every hour or two.

Or,

℞. Carbon. ammoniæ ʒii.
Extract. glycyrrh. ʒss.
Aq. fontanæ ʒviii.
Acid scillæ ʒss.
M. S. Take a table-spoonful every hour or two.

In instances of this kind, Hoffmann declares, that the following combination has often, in his hands, afforded complete relief in cases apparently hopeless:

℞. Flor. benzoes gr. vl.
P. camphor gr. ii.
Sacchar. alb. ℈i.
M. This dose to be taken every two hours.*

Opium cannot in general be given with propriety in this affection, after the bronchial secretion is fully established. By its tendency to suspend for a time the efforts to expectorate, it may readily give rise to dangerous accumulations of mucus in the bronchial tubes. When the cough is dry, however, and the arterial reaction has been moderated by depletion, the judicious employment of this narcotic will often procure much relief. "In combination with small doses of calomel, opium may sometimes be beneficially exhibited at an *early* period of the disease. When conjoined, these remedies not only diminish the cough, and assist expectoration, but seem likewise to regulate the secretion in adults." (Hastings.) In the bronchitis of old people, I have given opium and calomel in the proportion of half a grain of the former to two grains of the latter, every three or four hours, with much benefit in the early period of the disease. In very young children, however, opium is always to be used with the greatest caution.

External irritating applications to the thorax are highly important means in the cure of this disease. Immediately after blood has been efficiently abstracted, a blister should be applied over the anterior surface of the chest, and the surface kept discharging, by some irritating ointment. In children, much benefit usually results from the application of *leeches* to the chest after general bleeding. Leeching, indeed, constitutes a primary remedy in this affection, and ought always, if possible, to be practised. In many instances, I have known immediate and very great relief obtained from the local abstraction of blood in this way. A large emollient poultice should be applied after the leeches have been removed; or a blister may be laid over the breast, and suffered to remain until the skin is inflamed, and then replaced by a poultice. The warm bath may also be used with a good effect, where the skin is dry and harsh.

A regulated temperature of the atmosphere in the patient's

* Richter's Specielle Therapie, b. i. p. 424.

chamber is of no small degree of importance in the management of this disease. The air of the room should be kept comfortably and *uniformly* warm, so as to favour the action of the cutaneous exhalents.* Low or sudden variations of temperature are extremely apt to have a prejudicial influence in this affection.

During the debility, which generally remains after the disease has been subdued, benefit will often be derived from mild and nourishing diet, and the use of weak infusions of colomba, gentian, &c.

Sect. V.—*Chronic Bronchitis.—Bronchial Consumption.*

Chronic inflammation of the mucous membrane of the bronchia, is an affection of very frequent occurrence in cold and variable climates. In its simplest form it constitutes those protracted catarrhal affections which are common during winter in old persons, and in such as are predisposed to pneumonic irritation. Cases of this kind generally commence with the cold weather, and continue to the end of winter. They are characterized by a troublesome cough, attended with copious expectoration of a viscid muco-purulent, or a whitish frothy matter; uneasy and somewhat oppressed respiration, accompanied at times with wheezing; more or less weight and uneasiness in the epigastrium; loss of appetite; a slightly furred tongue; irregular action of the bowels; a quick and irritated pulse, particularly towards evening; and deep red and scanty urine. The coughing usually occurs in fits of considerable violence, being generally most severe in the morning on arising from bed, or on passing from a warm to a cold air. Sudden atmospheric vicissitudes, also, seldom fail to increase the violence and frequency of the spells of coughing; and the same effect is usually produced by the inhalation of irritating vapours, fine dust, smoke, and occasionally by the act of swallowing food. Slight transient pains are, at times, felt in the chest; frequently, however, no painful sensations whatever are experienced, except immediately after a fit of coughing, when a general aching pain is felt for a few moments in the breast.

There is another variety of chronic bronchitis, which, in its general phenomena and effects upon the system, bears so close a resemblance to tubercular phthisis, that it is not unfrequently mistaken for this latter affection—and which is described by authors, under the name of

Catarrhal Consumption.

A large proportion of the cases usually regarded as true tuber-

* Broussais, Histoire des Phlegmasies Chroniques, tom. i. p. 149.

culous consumption, consists of instances of chronic bronchitis; and as a correct diagnosis between these two affections is of much practical consequence, it is especially important that particular attention be paid to the distinctive phenomena, and pathological conditions of the present malady. This, as well as the former variety of bronchitis is the consequence generally of neglected catarrh; and it occurs occasionally as the result of an acute attack of bronchial inflammation. At first the symptoms resemble those of ordinary catarrh—the expectoration being viscid, thick, and opaque, but not yellow, containing small lumps, of a firm or viscid, grayish, translucent mucus, which sink in water. Mixed with these sputa, we sometimes find small membranous or flaky substances, which float on the surface of water—(Hastings.) As the disease advances, this viscid mucus becomes more and more mixed with a yellowish opaque fluid, resembling pus, and often slightly streaked with blood. In many instances, the expectoration, at last, acquires a whitish opaque appearance, resembling cream, and sometimes a uniformly greenish yellow colour, which readily sinks in water. At first, the pulse becomes slightly accelerated and tense towards evening; and the heat of the surface varies in the course of the day, being sometimes above, and at others below the natural standard. Partial sweats, about the head and breast, occur during the night. The thirst is generally considerably increased; the urine is high-coloured, and deposits a copious reddish sediment on cooling. A sense of soreness in the chest, with an occasional transient stitch in the side, is felt in the majority of instances; but there is rarely any *fixed* pain in the thorax. The cough is usually severe—particularly on rising out of bed in the morning, at which time, the respiration is more or less wheezing, accompanied with a feeling of tightness in the breast. If the disease continue unchecked in its course, the expectoration becomes at last purulent and extremely copious. Debility and emaciation proceed rapidly, and the difficulty of breathing, and sense of weight and tightness across the chest, become more and more distressing. The pulse is now generally very frequent, being seldom under one hundred and twenty in a minute. In the early part of the day the face is usually pale, but a deep flush on one or both cheeks is commonly observed during the evening febrile exacerbations. The tongue becomes clean, and in many instances "it assumes a shining appearance, and is redder than in health." Profuse and exhausting night sweats generally occur at this advanced stage of the disease; and towards the termination of fatal cases, colliquative diarrhœa, and œdema of the ankles, supervene as in tubercular phthisis pulmonalis. Indeed, in the latter stages of the disease, it is generally difficult, if not impossible, to distinguish it with certainty from tubercular consumption; nor is it less fatal in its tendency after

it has advanced to this stage, than genuine pulmonary consumption. When chronic bronchitis is complicated with *hepatic* disease, an occurrence by no means uncommon, it forms what authors have termed "*dyspeptic consumption.*" In this variety of the disease we have, in addition to the ordinary phenomena of chronic bronchial inflammation, various symptoms indicative of hepatic disorder—such as tenderness and tension in the epigastrium and right hypochondrium; irregularity of the bowels, with unnatural stools; a sallow hue of the skin, and yellowness of the conjunctiva; flatulency; indigestion, with variable appetite; increased dyspnœa, and cough after taking hearty meals; furred and brown tongue; foul breath; and occasional nausea or vomiting. In some instances of this variety of bronchitis, no symptoms indicative of pulmonic affection occur in the commencement of the malady, the only manifestations of disease being such as are usually present in liver affections. A dull pain or tenderness in the right hypochondrium, with increased uneasiness by lying on the left side; irregularity of the bowels; foul tongue; and depression of spirits, are, in such cases, the first symptoms complained of by the patient. "The first warnings of disease in the bronchial membrane are slight. There is a dry cough, unattended with any pain. By degrees the cough becomes more troublesome, and when it continues for some time, a tenacious mucus is expectorated. The breathing, too, is in some degree affected, and the patient complains of weight and tightness across the chest." The bronchial affection now advances with more or less celerity, until a copious purulent expectoration, and the usual symptoms of hectic, are fully established.*

Diagnosis.—The following diagnostic circumstances between chronic bronchitis, in the early period of its course, and tubercular phthisis, will in general enable us to distinguish these two affections from each other. In chronic bronchitis the face is generally pallid, and the lips of a bluish hue. In tubercular phthisis the lips are red, and the cheeks more constantly flushed. "In the beginning of chronic inflammation of the bronchia, the hands and feet are often cold, and the temperature of the surface altogether more variable than in tubercular consumption." More or less inflammation and soreness usually occurs in the upper portion of the pharynx, during the early period of chronic bronchitis, which is very rarely the case in tubercular phthisis. In the former affection the expectoration is free almost from the commencement, and continues to be blended with a large por-

* A Treatise on Inflammation of the Mucous Membrane of the Lungs, &c. By Charles Hastings, M. D. p. 277.

tion of transparent viscid mucus to the end of the disease.* In tubercular consumption, on the other hand, the cough is for a long time short and dry. Chronic bronchitis is attended with much more oppression in the chest, and wheezing respiration, though less pectoral pain, than true pulmonary phthisis.† The paroxysms of hectic fever are much less regular in chronic bronchitis than in tubercular phthisis. Besides these diagnostic indications, the presence or absence of the ordinary signs of a scrofulous habit, as well as the origin and general progress of the disease, will, in general, aid us considerably in discriminating these two affections. In its commencement and early stage, chronic bronchitis is usually much more distinctly inflammatory than scrofulous phthisis. It should be remarked, however, that these two forms of pulmonary disease may exist simultaneously; and phthisis pulmonalis is, in fact, not unfrequently associated in its advanced periods with chronic mucous inflammation of the bronchia.

Post mortem appearances.—On opening the thorax the lungs do not collapse; the capillaries of the mucous membrane are dilated and strongly injected, giving, in some instances, an appearance to this membrane, as if it were composed of a congeries of vessels—(Hastings.) This membrane is generally considerably thickened, and in many cases it is found ulcerated in different parts of its extent. The bronchial cells are usually much engorged with purulent matter, mixed with a bloody serous fluid, and a portion of frothy mucus. In some cases the bronchial membrane is covered with numerous minute pimples or eminences, bearing some resemblance to pustules—(Armstrong.) Sometimes the inflammation is found to have extended from the mucous membrane to the surrounding cellular and pulmonary structures; and sometimes the submucous cellular texture exhibits only a state of redness and vascular congestion; whilst in other instances this structure is condensed and elastic by the deposition of lymph into its interstices. When the inflammation has extended to the substance of the lungs, we usually find it somewhat hard and dense, with loss of its natural elasticity and compressibility—(Badham.) In some cases the pleura is thickly sown with minute tubercular depositions, showing that the diseased excitement had extended itself to this membrane. Broussais

* "Early in the disease," says Dr. Hastings, "the absence of pain during inspiration; the capability of resting on either side in bed, (when there is no abdominal disease;) the wheezing noise in respiration; the leaden colour of the lips, and the pallidity of the countenance; the appearance of the sputa, consisting almost entirely of mucus, occasionally streaked with blood, are symptoms sufficiently well marked to distinguish chronic inflammation of the bronchia from tubercular phthisis."—*Loco citat.* p. 290.

† Dr. Armstrong, on Consumption, &c.

states, that in the fatal cases of chronic bronchitis among the soldiers of the French army, induration of the substance of the lungs was almost a universal pathological phenomenon ;* and he ascribes the great frequency of this disorganized state of the pulmonary structure, to the exposure of the soldiers to wet and inclement weather, while in a state of debility and privation. He states that more or less extensive portions of the parenchymatous substance of the lungs were almost always found in a state of red hepatization, interspersed with softened and broken down parts, as if putrefaction had taken place in these points.

Causes.—Chronic inflammation of the mucous membrane of the bronchia may occur as the sequel of acute bronchitis. *Most commonly, however, it arises from neglected catarrh.* It is the consequence sometimes of measles; of hepatic disease; and of protracted disorder primarily located in the digestive organs. It may also proceed directly from the influence of atmospheric inclemency and vicissitudes of temperature; and from the inhalation of irritating vapours or particles of matter floating in the atmosphere—a common source of the disease among stone-cutters, needle-grinders, millers, &c. It occasionally occurs, also, in consequence of hooping cough—particularly from taking cold while under the influence of this affection.

Treatment.—The principal indications to be kept in view in the treatment of chronic inflammation of the mucous membrane of the bronchia, are:—1, to diminish the morbid excitability and excitement of the sanguiferous system; 2, to lessen the determination to, and derive the circulation from the inflamed mucous structure of the lungs; and 3, to correct the functional derangement of the skin, liver, and alimentary canal.

In the early stage of the disease, the activity of the pulse will sometimes call for moderate general bleeding; but this evacuation can seldom be often repeated, even in moderate quantities, without the risk of doing injury by its tendency to increase the general irritability and weakness which attend this affection. Where the general phlogistic excitement indicates the propriety of bleeding, it will always, perhaps, be better to trust to occasional leeching or cupping. After the disease has assumed the character of phthisis, the abstraction of blood may be regarded as very generally altogether improper.

From the intimate sympathetic relation which subsists between the skin and the lining membrane of the bronchia, it is of great importance in the treatment of this affection, to keep up a regular action of the cutaneous exhalents; for, in proportion as we increase the activity of these emunctories, so do we, in general,

* Phlegmasies Chroniques, tom. i. p. 144.

lessen the afflux of the fluids to the lungs. For this purpose, the patient should be directed to wear flannel next the skin, and to protect himself by proper clothing against the influence of cold and atmospheric vicissitudes. An equable and mild temperature will generally contribute greatly to the successful management of this disease. No remediate treatment can procure permanent advantage in this complaint, when the patient is much exposed to a damp, variable, and inclement atmosphere. If the patient's situation or circumstances do not admit of his visiting warm and uniform climates, he should remain in his chamber—the air of which must be kept at a comfortable and regular temperature, during the cold and variable seasons of the year. When the weather is mild, exercise in the open air will, in general, prove salutary in this affection.

External irritating applications to the breast, are among our most useful means for combating this disease. Blisters may be employed for this purpose; but pustulation by frictions with tartar emetic, or white precipitate ointment, will produce a more permanent, and, in general, a more efficient counter-irritation. Setons, or caustic issues, are much recommended by some writers; but their good effects are not equal, I think, to those which may be derived from more extensive irritation. Broussais recommends the application of large emollient poultices over the breast. He asserts, that he has cured inveterate cases of catarrhal inflammation by the continued use of poultices of this kind. They are to be preferred to blisters, he says, in nervous, irritable, and plethoric patients. I have myself known great benefit to be derived in delicate and nervous persons affected with this disease, from emollient poultices to the breast. After the skin has been pustulated by tartar emetic ointment, poultices of this kind should be kept applied over the breast until the pustules are entirely healed. In the milder variety of chronic bronchitis described above—that is, in those chronic catarrhal affections which are apt to occur in old persons during the winter, mild emetics have been found useful by dislodging the viscid secretions with which the bronchial cells become engorged; but their beneficial effects are generally only palliative. To moderate the general irritability of the system, and the velocity of the circulation, *digitalis* may be advantageously employed. In the advanced stages of the disease, when the expectoration has acquired a purulent character, I have known considerable benefit to be obtained from the use of digitalis and tinct. of the balsam of tolu. according to the following formula:

R. Tinct. digitalis ℥ss.
——— tolutani ℥i.
M. S. Take a tea-spoonful three times daily.

At an earlier period of the disease, small doses of digitalis in union with pulvis antimonialis, will sometimes prove serviceable, by lessening the momentum of the circulation, and sustaining the regular action of the cutaneous exhalents.

Dr. Hastings speaks very favourably of the effects of squills in the advanced stage of this complaint—more especially in those cases which assume the character of chronic cough. I have used this article, in combination with the seed of *phelandrium aquaticum*, with much benefit in a considerable number of cases. I usually order it thus:

℞. Sem. phelandr. aquat. ʒiss.
Pulv. scillæ gr. xii.
Pulv. opii gr. ii.
M. Divide into eight equal parts. S. Take one three times daily. The *phelandrium* is much extolled by some German writers as a remedy in this disease.

The use of the tincture of colchicum is recommended by some in the treatment of this affection. Hastings observes, that he has found it to allay the cough, promote the expectoration and flow of urine, and keep up a regular action of the bowels. It may be used, he says, where squills, from their greater tendency to excite the sanguiferous system, are inadmissible. From twenty to thirty drops may be given three times daily. I have, in a few instances, known this medicine in union with the tincture of belladonna, to produce excellent effects in this disease. Twenty drops of the former may be given with from thirty to forty drops of the latter thrice a day.

Some of the vegetable balsams have of late years been particularly recommended in chronic inflammation of the bronchia. Of these, the balsam copaiva is decidedly the most useful. Dr. Armstrong observes, that this article "seems in many cases to exert a specific influence over the mucous membrane of the trachea and its branches; it increases the flow of urine; generally keeps the bowels regularly open, and sometimes excites a peculiar itching in the skin. At first, it should be given in doses of from thirty to forty drops three times a day, and gradually increased afterwards to sixty or eighty drops at each dose." I have myself used this article with prominent benefit in the advanced periods of the disease; but, in many instances, little or no apparent benefit resulted from its use; and, in a few cases, it was evidently injurious, both by weakening the tone of the digestive organs, and by increasing the general febrile irritation. Morgagni employed this balsam in conjunction with sulphur in chronic catarrhal affections; and Armstrong asserts that he has given this combination with unequivocal advantage in the present disease. I have usually given the balsam according to this formula:

℞. Sodæ subcarbonat. ʒiss.
Vitel. ovor. No. iii.
Sacch. albi. ℥ss.
Bals. copaib. ʒvi.
Aq. fontanæ ℥viii.
Tinct. opii gtt. Lx.
M. S. Take a table-spoonful three times daily.

Armstrong has found an emulsion of the spirits of turpentine very efficacious in this disease; but its powers are too irritating to admit of employment in the ordinary cases of the disease.

The *Peruvian bark* has been found a useful remedy in this affection, when the night sweats are profuse and the general debility considerable. Given with diluted sulphuric acid in such cases, its beneficial effects, says Dr. Hastings, are sometimes very evident. It tends to restrain the debilitating night sweats, and "to alter the secretion from the mucous membrane of the lungs." In chronic bronchitis succeeding hooping-cough, I have used the sulphate of quinine with marked advantage. In several instances of this kind, I gave this article in union with the extract of *conium*, with the happiest effect.

Opium is often decidedly beneficial in this disease. Given in combination with ipecacuanha, or in the form of Dover's powder, it always procures great temporary relief, and may materially assist other remedies in the reduction of the bronchial inflammation. It is inadmissible, however, so long as there is much febrile irritation; but in the advanced period of the disease, particularly in the chronic bronchial inflammation of old or debilitated subjects, where the system is irritable and the cough frequent and troublesome, six to eight grains of Dover's powder, given in the evening, will suspend the cough and procure comfortable rest during the night. The extract of conium or hyoscyamus with ipecacuanha, may also be usefully employed, for the purpose of allaying the general irritability and cough, and improving the character of the expectoration. The same intentions will, in general, be answered by full doses of *lactucarium*. This article is particularly recommended by Dr. Duncan, in the management of pulmonary affections. It may be used with benefit in instances where opium, from its constipating effects, or other disagreeable consequences, is inadmissible. The dose is from two to three grains.

The *prussic acid* has been employed with benefit in this affection. From its powerful tendency to reduce the general excitability of the system, it is, without doubt, well calculated to do good in this complaint. Its variable and dangerous activity, however, renders it an extremely precarious and hazardous remedy. I have known a few instances in which considerable relief was obtained from this medicine; but in the majority of

cases no advantage was derived from it, and in two it produced alarming prostration. It may be given according to this formula.*

℞. Acid. hydrocyanici. gtt. viii.
Mucilag. g. arab. ℥ss.
Sacch. albi. ʒii.
Aq. fontanæ ℥viii.
M. S. Take a table-spoonful every three or four hours.

In the first edition of this work, I omitted, through inadvertence, mentioning the *sugar of lead* as a remedy in chronic bronchitis attended with hectic. From my own experience with this article, I am entirely persuaded, that it will more generally afford relief in this affection, than any other remedy we possess. When the expectoration is copious, and the night sweats profuse, it rarely fails to moderate and improve the former, and to check the latter evacuation. In most instances, too, it exerts a manifest controlling influence over the febrile irritation. Indeed, I am persuaded, that the powers of the *sugar of lead* as a remedy in this form of consumption, are not sufficiently known to the profession in this country. In Germany it has long since been used by many eminent practitioners, as a favourite remedy in this affection. Osiander speaks in the most favourable terms of its powers in this respect. He asserts that it is not only an excellent and prompt palliative, but the most certain means for effecting a cure we possess.† Hildebrandt, also, strongly recommends its use in this disease. There is a very remarkable case of what is called *blenorrhœa pulmonum* related in Horn's Archives, which was radically cured by the internal use of this remedy.‡ In France, M. Fouquier has been long in the habit of prescribing this article in consumption, and his confidence in its salutary powers appears to be very great. He asserts that the sugar of lead may be regarded as a *specific remedy* for the profuse night sweats of hectic. It must be observed, that although a valuable means for checking the copious sweats in every variety of consumption, the sugar of lead cannot be expected to procure any permanent or radical benefit, or effect a cure in tuberculous phthisis, or in any form of this disease attended with structural lesion of the lungs. In that variety of consumptive disease, however, which depends solely on chronic inflammation of the mucous membrane of the lungs—and in which the expectoration of puruloid matter is generally very copious, a well regulated use of this remedy not unfrequently contributes very greatly to the complete restoration of health. Within the present year, I succeeded in curing a case of this kind—attended with all the usual

* The deleterious effects of the prussic acid may be speedily counteracted by a full dose of the aq. ammonia, or of a solution of the carbonate of ammonia.
† Osiander, Entwickelungskrankeiten des weiblichen geschlechts.
‡ Archiv. d. pract. Med. B. 4. Hf. 2. s. 287.

symptoms of fully developed phthisis, in a child about five years old, by the use of the sugar of lead. This case was the consequence of hooping-cough—a disease which not unfrequently terminates in chronic bronchitis. The best mode of using this article, in the present affection, is to give it in union with Dover's powder, or with the extract of hyoscyamus. One grain of the lead with four grains of Dover's powder, or two grains of the extract of hyoscyamus, should be given three times daily. The quantity of the lead must be gradually increased, until it amounts to three or four grains at each dose. It is a fact, pretty generally known, that the sugar of lead very rarely produces colic. Osiander declares that in the course of thirty years practice, during which he prescribed it in several hundred cases, it never gave rise to any injurious consequences.*

The inner bark of the *ampelopsis hedera* has been employed with great advantage in the advanced stage of chronic bronchitis. It is given in decoction, in the proportion of an ounce of the bark to a pint of boiling water—of which a wine-glassful is to be taken four times daily.† In a single instance in which I have lately used this article, I obtained marked benefit from it. The cough gradually declined, the expectoration became improved and diminished, and the general irritation of the vascular system subdued.

The bark of the *white willow* in the form of powder, formed into an electuary with sulphur and honey, was employed with much success by Dr. Kerckhoff, in the last stage of consumption from chronic inflammation of the mucous membrane of the bronchia.‡ The root of the *actea racemosa* has been employed by some American physicians in chronic pulmonary affections. I have had some experience with this article in the treatment of chronic inflammation of the mucous membrane of the lungs; and its effects have appeared to me beneficial in several instances. I have found it to diminish the velocity of the circulation, and to render the expectoration less copious and of a more natural appearance. It is given in decoction in the proportion of an ounce of the root to a pint of water. A table-spoonful of it is to be taken every four hours during the day. Its operation is slow, and requires protracted use to obtain any particular advantage from it.

When chronic bronchitis is complicated with hepatic disease, mercury must be used in conjunction with the other remedies employed for the bronchial affection. Small doses of blue pill should be given until the gums are very slightly inflamed; and this degree of mercurial action must be sustained so long as there

* Casper's Characteristik der Französischen Medicin. p. 239.

† See Dr. Atkin's paper in the Philadelphia Med. and Surg. Journal, October, 1826.

‡ Transact. of Lond. College of Physicians, vol. vi.

is any tenderness in the right hypochondriac or hypogastric regions, and the alvine evacuations indicate deficient or vitiated biliary secretion. I have used the following pill with peculiar benefit in this modification of the disease.

℞. Massæ hydrarg. ʒi.
Aloes soccot. ℈i.
Tart. antimonii gr. iii.
M.—Divide into thirty pills. Take one every morning and evening.

In some instances, *calomel* will agree much better with the stomach than the blue pill—the latter giving rise to general irritation and more or less gastric disturbance. When calomel is used, it should be given in very small doses, and may be advantageously combined with the extract of conium.

Sulphur was formerly much employed in chronic pulmonary affections of this kind. In chronic catarrh, attended with a puruloid expectoration, I have known much benefit derived from Engelhard's mixture.*

Of late years a great deal has been said of the inhalation of the fumes of tar, in the treatment of chronic inflammation of the mucous membrane of the lungs. That this remedy has been employed with some success in this complaint, the testimony published by men of eminence and respectability, does not permit us to doubt. It appears to be now generally admitted, however, that its powers are by no means so salutary as was at first asserted. Hastings states, "that in chronic bronchitis, the inhalation of tar-fumes seems to assist other remedies in restoring the mucous membrane to its healthy secretion; and in some very obstinate cases, the inhalation alone has appeared to remove the diseased action in the mucous membrane of the lungs. In other instances, the inflammation has been aggravated and rendered acute by it. When the habit of the body is irritable, and the inflammation at all active, the symptoms are increased by its use; but if the disease have been long in a chronic state, and the habit of body not irritable, relief may be expected from it." I have employed this remedy in perhaps a dozen cases; in a few instances, I found it particularly beneficial, though generally, it failed to do any good whatever. The fumes of *resin* have also been recommended in the present complaint. A few pieces may be thrown upon hot coals on a shovel, and brought near the patient, so as to cause him to inhale the fumes. The *tar* is used by placing it in a dish over hot coals, and suffering it to evaporate slowly, until the air of the patient's chamber is well impregnated with the fumes. If the cough and dyspnœa are aggravat-

* ℞. Extract. hyoscyam.
Flor. sulph.
Extract. glycyrrh. āā ʒi.
M.—Of this mixture eight grains are to be taken three times daily.

ed by these inhalations, which frequently happens, they must be discontinued.

The inhalation of powdered vegetable substances, dispersed in the air breathed by the patient, has been used with marked benefit in the phthisical stage of chronic bronchial inflammation. Dr. Darwin mentions the inhalation of the dust of cinchona as having afforded relief in chronic pulmonary complaints. I have known the inhalation of the dust of oak bark effect a complete cure in an instance of chronic bronchitis.

Sect. VI.—*Phthisis Pulmonalis.*

Pulmonary Consumption.

The assemblage of morbid phenomena, usually designated by the term *consumption*, may arise from various pathological conditions of the respiratory organs, which, in a practical point of view, it is of much consequence to discriminate from each other. Thus, the symptoms by which physicians are in the habit of recognising the presence of consumption may depend: 1. On chronic inflammation of the mucous membrane of the bronchia; 2. On ulceration and chronic inflammation of the larynx or trachea; 3. Chronic inflammation of the pleura; 4. Inflammation and the formation of vomica, or abscesses in the parenchymatous substance of the lungs; 5. Ulceration of hepatized lungs; 6. Ulceration with melanosis; 7, Infarction of the lungs with morbid cartilaginoid granulations; and, 8. Softening of tuberculous matter in the lungs, with more or less chronic inflammation and disorganization of the pulmonary tissue.

Of the first of these varieties of pulmonary disease, I have already treated in the preceding section, under the head of *chronic bronchitis;* and this, the catarrhal or pituitous consumption of authors, constitutes, probably, the majority of the reputed cases of phthisis pulmonalis in cold and variable climates.

1. *Laryngeal and tracheal Consumption.* Ulceration of the *larynx* or *trachea* gives rise to what is termed *laryngeal* or *tracheal* consumption, a variety of phthisis, which is generally rapid in its course, and always of a most fatal tendency.

Tracheal and laryngeal consumption, usually begin with a slight tickling cough; an obscure feeling of uneasiness or pain in some part of the trachea or larynx; occasional oppression of breathing, and slight febrile irritation in the evening. One of the first and most constant symptoms of this variety of the disease is *a change of the voice;* which becomes indistinct, hoarse, feeble, and whispering. The patient is apt to feel and press the larynx or trachea with his fingers. When the larynx is the seat

of the local affection, the first words in the morning are uttered with considerable difficulty. The pain in the larynx or trachea, is always increased by coughing, external pressure, and by the inhalation of irritating vapours. When the trachea is the part affected, an increase of the pain is experienced on bending the head backwards, or on turning it round. This is not the case when the larynx is the seat of the disease; here the pain, as well as the cough, is increased by the use of stimulating gargles, and the inspiration of cold and damp air. In laryngeal consumption, the cough is generally violent early in the morning, until something is expectorated; and like spasmodic cough, it often subsides for a considerable time, and then returns in sudden and violent paroxysms, the inspiration during the fit of coughing being stridulous, as in croup. A fit of coughing is almost always excited, when the patient begins to swallow; and it seems at first as if the cough were excited only by quick and careless swallowing, yet as the disease advances, the utmost caution in this respect will not prevent this act from exciting the cough. (Armstrong.) The quantity of the sputa is not great in the laryngeal variety of the disease; but, in tracheal phthisis, it is often abundant, consisting chiefly of a viscid, transparent, and frothy mucus, with small masses of purulent matter floating in it. When the disease is once fully established, the usual symptoms of hectic fever occur, the body wastes rapidly, the skin becomes sallow, and the face generally pale, with a transient flush on one or both cheeks in the evening, and a peculiar haggard and anxious expression of the countenance, with an irritable and dejected state of the mind.

The ordinary *causes* of this variety of phthisis are: neglected catarrh; whooping-cough; measles, and syphilis. Dr. Armstrong mentions an instance, which was excited by an external tumour pressing on the wind-pipe.

2. *Pleural Consumption.* Another variety of consumption, as is stated above, depends on effusion into the cavity of the thorax from *chronic inflammation of the pleura.* While the effusion into the cavity of the chest is going on, the lung becomes more and more separated from the surface of the thorax, being gradually compressed by the accumulating fluid, until it is reduced to a very small size, and more or less disorganized in its structure. Whilst this is going on, ulceration sometimes takes place in some part of the pulmonary pleura, and the corresponding substance of the lung, and an opening is thus made into the bronchial tubes, through which the effused sero-purulent fluid is discharged by coughing or expectoration. When this takes place, irritative fever, with night sweats, frequent cough, emaciation, and in short, all the ordinary symptoms of phthisis pulmonalis, usually supervene. This form of pneumonic disease

is generally the consequence of acute pleuritis. This affection is characterized by a sense of oppression in the chest on lying down; difficult and hurried respiration on ascending stairs, or muscular exertion; short, disturbed sleep; paucity of urine; a short, tickling cough, aggravated on first lying down; spells of hurried and oppressed breathing after speaking; and generally, more or less soreness of the external surface of the affected side of the chest. The patient is easiest when in a sitting posture; and "if requested to take a deep inspiration while in the erect position, he will generally do it with little apparent difficulty; but lay him down flat, and cause him to fetch his breath deeply, he will be almost certain to complain of pain, tightness, soreness, load, or some kind of inconvenience in the chest." (Armstrong.) Death often occurs suddenly, and is almost invariably preceded by considerable œdema of the legs and feet. In some instances, after the effused fluid is discharged through the lungs, the progress of the disease becomes arrested, and the patient recovers a tolerable state of health. When this occurs, the affected side of the thorax contracts to a very manifest degree, forming what Laennec describes under the name of *contracted chest*. In some instances, where ulceration establishes a communication between the bronchial cells and the cavity of the pleura, more or less of pneuma-thorax occurs; but more generally adhesions take place around the fistulous opening, which prevent the escape of air into the chest from becoming so considerable as to compress the lungs. (Laennec.)

3. *Imposthumous Consumption.*—Consumption from the formation of *an abscess* in the lungs, is an extremely rare occurrence, although formerly supposed to be one of the most common forms of the disease. Laennec states as the result of his observations, that small abscesses in the pulmonary tissue are not found above four or five times, and large ones not above once in several hundred cases. He regards almost the whole of the reported cases of pulmonary abscesses of the lungs as excavations formed by the softening of tubercular masses. It is nevertheless probable, from the observations of others, that abscess of the lungs is not so uncommon as is asserted by Laennec. Armstrong mentions several instances of this kind, and cases are related by Morgagni, Baillie, Foubert, Wright, Heller, Lettsom, and many others.

4. *Ulceration with melanosis* of the substance of the lungs, is also occasionally met with in phthisis pulmonalis. I have seen one remarkable instance of this variety of phthisis, in consultation with Dr. Monges and Dr. M'Clellan. Bayle says that this form of the disease occurs only in adults, and most commonly in persons of advanced age. "The lungs of those who die of this affection, present more or less extensive ulcerations, the

parietes of which are as black as charcoal, very firm, and several lines in thickness. The parts not in the immediate vicinity of these melanosed ulcers, appear to be perfectly healthy; but if the disease affects the whole lung, it is hard, compact, black, resembling sometimes leather half burned."

Phthisis from melanosis is often of long duration, and seldom gives rise to any alarming symptoms until it has continued for a considerable time. The patient usually has a moderate cough, attended with a whitish or white puruloid matter, slightly opaque, and usually in roundish masses, swimming in a considerable quantity of a thin mucus. These sputa always swim in water. There is little or no pain whatever felt in the chest; and in some cases the patient is entirely free from feelings of indisposition. Nevertheless, the body gradually wastes; the pulse is generally somewhat more frequent than natural, and, occasionally, the cough excites vomiting. At last the emaciation usually becomes extremely great, although the patient seldom complains of much illness or uneasy sensations. Very considerable œdema of the legs is a common occurrence towards the conclusion of the malady.

5. *Cancerous Consumption.*—The substance of the lungs is liable to a species of cancerous degeneration, giving rise to a slow and most fatal variety of phthisis pulmonalis. Fortunately, however, this is a very rare variety of pulmonary disease. When the cancerous masses are insulated, there are, in general, many of them throughout the lungs; but the surrounding pulmonary structure is usually in nearly a healthy state. "When, however, the cancerous masses are not insulated, different portions of the lungs, and, occasionally, some of the bronchial glands, are transformed into a white substance, evidently of a cancerous character, belonging, in fact, to that variety of cancer designated by M. Laennec under the name of *dégénérescence cérébriform.* The diseased parts are white, somewhat shining, sometimes of a firm consistence, and at others already softened, and always traversed by extremely small blood-vessels. When the softened parts are compressed, a liquid matter issues from a great number of points, bearing a strong resemblance to cream. This degeneration pursues the same course that other cancerous affections do, and resembles much in its intimate structure the cancerous masses which are sometimes developed in the liver, as well as the alterations which occur in the mucous membrane of the stomach, when this organ is affected with scirrhus." (Bayle.)

The progress of cancerous consumption is very slow. At first, the respiration is somewhat obstructed, attended with a dry cough, which is rarely very troublesome. As the disease advances, the patient begins to feel some pectoral oppression, the cough becomes more troublesome, and the patient experiences,

at times, transient pains in the chest. These pains gradually become more frequent and prolonged, until they are constant, at the same time that the cough becomes less dry, and a more or less abundant expectoration of white matter ensues. The skin is usually of a pale yellow colour. This affection, says Bayle, seldom if ever occurs in persons under thirty years of age, and the majority of those who labour under it are at the same time affected with cancerous tumours in other parts of the body.*

6. *Granular Consumption.*—In some cases of phthisis, the lungs contain an immense number of *transparent*, shining, miliary granulations. These granulations vary in size from that of a millet seed to that of a grain of wheat, and appear to be of a cartilaginous consistence. Mr. Bayle thinks that they differ entirely from miliary *tubercles*, which latter, he says, are always gray, or white and *opaque*, and terminate by complete softening. The miliary granulations, generally, at last, give rise to ulceration of the pulmonary parenchyma, and when this takes place, the ulcerated cavity is always found lined with an albumenoid membraniform substance.†

7. *Tubercular* or *scrofulous Phthisis.*—This is a most fatal and unmanageable form of pulmonary consumption. In the commencement of the disease, slight aching pains, with a sense of tension or tightness, is experienced in some part of the chest, together with a short and dry cough, which is readily excited by muscular exertions. Respiration is shorter and more frequent, and deep inspiration is usually attended with a feeling of uneasiness and tightness in a particular part of the breast. These symptoms gradually become more conspicuous; and at length slight febrile irritation occurs towards evening, and the pulse and respiration continue to be somewhat accelerated throughout the whole day. A fit of coughing usually occurs in the morning, and the patient rises out of bed in a relaxed, languid, and feeble condition. An extreme liability to catarrh, on the slightest exposure to cold and damp air, exists. The bowels are usually somewhat torpid; the tongue is moist, often clean and of a pale pink-colour, or covered with a thin white fur. By degrees the cough becomes more frequent and troublesome—particularly in the evening and morning, or at night on awaking from sleep. Great sensibility to low temperature is manifested by the patient. As the disease advances, the albuginea acquires a peculiar pearly whiteness; the skin, lips, tongue, and fauces, become dry in the afternoon; slight chills regularly occur towards evening, followed by distinct febrile exacerbations, during which one or both cheeks are suffused with a circumscribed

* Recherches sur la phthisie pulmonaire : par G. L. Bayle, p. 36.
† Loco citat. p. 87.

flush; a dry and burning heat is felt in the palms of the hands and the soles of the feet; the breathing is very quick and short, and the pulse very frequent, small, quick, and tense. These febrile paroxysms continue until towards midnight, when they terminate in more or less profuse perspiration, which continues till morning, leaving the patient exhausted, languid, and depressed. Previous to the occurrence of these latter irritative phenomena, the expectoration, which at first was scanty and frothy, becomes thicker and purulent, and *occasionally streaked with blood.* By degrees the sputa assume more and more the character of genuine pus; the evening exacerbations become more distinct, the night sweats more profuse; the burning in the palms of the hands and soles of the feet more distressing; the cough more frequent and violent; and emaciation makes evident progress, attended with increasing failure of strength—in short, *hectic* fever is now completely developed—the pulse being seldom less than 130 during the evening exacerbations, although generally languid, weak, soft, and not much above its natural frequency in the morning. Towards the unfavourable termination of the disease, œdema of the feet, and colliquative diarrhœa, almost invariably come on, accompanied with a weak and hoarse voice, often aphthæ in the fauces, difficulty of swallowing, and sometimes ulcerated throat. The mind generally continues to be unaffected to the last; but in some instances, "a degree of languid delirium occurs for some days, and occasionally total imbecility for a week previous to death."

It is a remarkable circumstance, that pulmonary consumption is very generally suspended in its progress by pregnancy. I have met with five or six instances of this kind. As soon as the delivery of the child has taken place, the consumptive symptoms resume their force, and generally advance with rapidity to a fatal termination.

It is equally remarkable that the symptoms of pulmonary consumption occasionally, though indeed very rarely, alternate with mania. I am at this time attending a young lady in the last stage of phthisis, who has for four months past been in a state of continued mental derangement. She complains of no pectoral uneasiness, and does not appear to be conscious of labouring under this disease; although her body is now extremely emaciated, and she coughs almost continually, and has a copious purulent expectoration.

Tubercular consumption probably never occurs, except in individuals of a strumous diathesis; and it is doubtful, as Dr. Armstrong observes, whether tubercular matter be ever formed in the lungs, without a constitutional or hereditary predisposition to them. Be this as it may, it appears to be well ascertained, that wherever this predisposition does exist, any cause which is

capable of irritating the lungs may give rise to the deposition of tubercular matter into their substance, and lead, consequently, to the development of phthisis pulmonalis. Tubercular matter would seem to be formed by a kind of exudation or secretion into the pulmonary tissue; and as it appears to be unorganized, may be regarded as an extraneous substance, obstructing the pulmonary circulation, and giving rise to more or less local irritation. Tubercular depositions in the lungs do not, however, inevitably lead to consumption; for it would seem to be well ascertained, that tubercles may exist in the pulmonary structure *in a dormant* state—that is, without entering into the process of softening, or exciting inflammation—and without giving rise either to local inconvenience, or general disturbance of health—(Armstrong, Laennec.) In individuals of a scrofulous habit, the formation of tubercles is sometimes very rapid, when pulmonary irritation is excited by any accidental irritating cause. In the beginning, tubercles have the appearance of semitransparent grains; and as they gradually increase in size, they become united into irregular masses, and assume a yellowish and opaque appearance. M. Laennec asserts, that the conversion of the tubercular matter into a soft pus-like fluid, is not effected in a manner similar to what takes place in suppurative inflammation; but by a peculiar process of softening, wholly distinct from suppuration. The softening commences in the centre of the tubercle, and gradually proceeds outwards, until the whole mass is converted into a whitish cream-like matter, which, making its way into the bronchial tubes, is discharged by expectoration, leaving a kind of fistulous cavity. These tubercular excavations become lined with "a species of morbid membrane, of a white and opaque appearance, and very soft consistence; external to which, another membrane of a semi-cartilaginous structure is formed. Bayle thinks, that the *pus* expectorated in scrofulous consumption is secreted chiefly by the lining membrane of the tubercular cavities; but Laennec asserts, that the greater part of the purulent matter expectorated proceeds from the mucous membrane of the bronchia, which always suffers irritation and chronic inflammation, to a greater or less extent, in every variety of pulmonary consumption. Purulent expectoration from this source occurs in some instances of tubercular lungs, even before the tubercles have undergone the process of softening. Every case of tubercular phthisis, consists therefore of at least two, and sometimes three, simultaneous processes; namely, 1, "the proper tubercular action either in a state of growth or increase, or in that of softening or destruction; 2, of a degree of chronic inflammation of the mucous membrane of the bronchia; and, 3, sometimes of inflammation of the pulmonic tissue, of a chronic character, and tending to hepatization."

Causes.—As has already been stated, persons may be decidedly predisposed to phthisis, and even affected with a tubercular state of the lungs, and yet escape the disease, if no adequate exciting cause supervene to rouse it into action. In some instances, functional or organic disease of the liver develops the disease where the predisposition to it exists. Catarrhal affections, however, are by far the most common exciting causes of the disease. The tubercles may also be excited into action by a fixed irritation located in any of the principal viscera, more especially in the alimentary canal. Repelled cutaneous eruptions have a strong tendency to develop the tubercular action, as indeed all other morbid impressions on the skin have in subjects of a phthisical habit. The sympathy between the external surface and the lungs is intimate and strong, and an irritation seated in the former, seldom fails to manifest itself in the latter organ—more especially when the lungs are in a state of habitual debility or predisposition to morbid action. It is on this account, that phthisis pulmonalis is so common a disease in cold and variable climates, where the cutaneous function is so liable to sudden and frequent interruptions or variations of activity. Among the ordinary exciting causes of this affection, we may also mention the healing up of old discharging sores; atmospheric vicissitudes; the abuse of mercury; intemperance in the use of spirituous liquors; sedentary occupations; excessive venereal indulgence, and onanism; copious losses of blood; the depressing passions; the admission of irritating vapours or fine particles into the lungs—to which latter cause, stone-cutters, glass-grinders, millers, needle-grinders, &c. are particularly exposed.

Prognosis.—The different varieties of pulmonary disease mentioned above, vary very considerably in the degree of sanability peculiar to them respectively. That form of consumptive disease, which depends upon chronic bronchial inflammation, is by far the most under the control of judicious remediate treatment; and where the mucous tissue remains free from ulceration, or the subjacent pulmonic structure has not become consolidated, recoveries are by no means uncommon.

Laryngeal and *tracheal* consumptions are extremely dangerous affections. I have never known an instance of recovery from this variety of the disease. Cases of recovery have, however, been related by authors, but the number of such instances is very limited.

Consumption from chronic pleuritis, is much more difficult of cure than that which depends on chronic inflammation of the mucous membrane of the lungs; yet in some instances, the disease subsides, and the patient regains a considerable degree of health. When a cure is effected, the effused fluid is either gradually absorbed while the lung expands, or it is discharged

through the lungs by an opening into the bronchial tubes from the cavity of the pleura, or it escapes externally by an opening into the cavity of the chest through the intercostal spaces.

Tubercular consumption may be regarded as an incurable disease; for tubercular matter, so far as we know, is wholly incapable of being absorbed or otherwise removed. "Previously to the knowledge of the true character and mode of development of tubercles," says Laennec, "and while consumption was considered as a consequence of chronic inflammation, and slow suppuration of the pulmonary tissue, medical men did not question the possibility of curing this disease by a suitable mode of treatment, especially if taken in time, and during the first stage. It is now, however, the general opinion of all those who are acquainted with the actual state of our knowledge respecting the pathology of diseases, that the tubercular affection, like cancer, is absolutely incurable, inasmuch as nature's efforts towards effecting a cure are injurious, and those of art useless." However impossible it may be to remove tubercular matter when once formed, or to cure consumption depending on it, there can exist no doubt that we may occasionally so retard, or even arrest its progress by proper management, as to prolong life to a very considerable extent. Nay, it is equally certain, that by carefully avoiding those causes which tend to favour the conversion of tubercular matter into a pus-like fluid, persons who are manifestly strumous, or affected with incipient tubercles in the lungs, may pass through a long life without the actual development of consumptive symptoms. Although tubercular consumption may be regarded as incurable by art, yet in some rare cases a spontaneous cure has taken place after the softening of the tubercular matter and the formation of an ulcerous excavation. Laennec, upon whose authority this statement is made, mentions ten cases which terminated favourably in this way. Such cures, he says, are affected in two ways; 1. by the cavity becoming invested by a new membrane of a semi-cartilaginous structure, which, when completely formed, constitutes a kind of internal cicatrix, analogous to a fistula, and "is, in many cases, not more injurious to health than this species of morbid affection;" 2. the cure may also be effected by a spontaneous obliteration of the cavity by a cicatrix consisting of cellular, fibrous, or cartilaginous structure. Such cures are, however, extremely rare, and depend in no manner on medical treatment—(Laennec.)

Treatment.—Of the treatment appropriate to *catarrhal consumption*, I have already spoken fully, under the head of *chronic bronchitis*, and the subsequent therapeutic observations refer chiefly to tubercular phthisis. Notwithstanding the uncontroulable and fatal character of tubercular consumption when once fully developed, patients labouring under this form of disease

are not to be abandoned to their fate, without making an effort to arrest, or at least to retard its progress; for although the hope of *curing* the malady, after its complete establishment, is wholly fallacious, experience has fully demonstrated the fact, that, by judicious management, we may often keep the tubercles in a dormant state, interrupt their progress, or at least greatly retard their passage into an active condition. In consumptive habits, every thing which tends to irritate the system, more especially the respiratory organs, should be carefully avoided. Attention ought, above all, to be directed to the regular maintenance of the perspiratory function; and with this view, the patient should be directed to wear flannel next his skin; to protect himself by proper clothing against the influence of low temperature; and to avoid, as much as his circumstances may admit, the effects of atmospheric vicissitudes. In the incipient stage of every variety of pulmonary consumption, our constant object should be to counteract the inflammatory diathesis of the system, and to remove all sources of irritation. The regimen must be strictly antiphlogistic. In general, vegetable and farinaceous diet, with milk, is the only proper nourishment for a patient labouring under incipient phthisis. The system in all phthisical habits is peculiarly excitable, and readily thrown into a state of general and injurious irritation by even weak exciting causes. It would be in vain to expect a reduction of the local pulmonary irritation, so long as the system generally is in a state of preternatural excitation. In conjunction with a mild unirritating diet, the wearing of flannel next the skin, and the careful avoidance of inclement and variable weather, gentle exercise, either by walking, riding on horseback, or in an open carriage, when the air is mild and uniform, will tend to invigorate the system, and lessen its morbid irritability.

Bleeding is highly recommended by some in the early period of phthisis pulmonalis; and when cautiously employed in cases attended with an evident inflammatory condition of the general system, its effects are often beneficial. To draw blood copiously, or very frequently, however, would, in most instances, prove injurious by increasing the debility and morbid excitability of the system. The abstraction of blood by cupping or leeching, in cases which indicate the propriety of direct depletion, will in general answer all the purposes, which can be expected from this measure. To expect to effect the permanent reduction of the quickness, tension, and frequency of the pulse by venesection, is a fallacious hope. The system in this disease is preternaturally excitable or irritable; and in order to reduce the velocity and momentum of the circulation, measures must be employed which tend to subdue this morbid irritability, an effect which cannot be obtained from venesection. To accomplish this

purpose, we possess no remedies which are so safe and so effectual as digitalis, and small doses of tartar emetic. The former of these articles has a powerful tendency to diminish the excitability of the heart and arteries, and consequently the velocity of the circulation. Much diversity of opinion has been expressed in relation to the value of this medicine in consumptive affections. My own observations have led me to the conviction, that under careful management, and in conjunction with a well regulated diet, and proper attention to the cutaneous functions, much good may be derived from its employment in incipient phthisis. Its salutary operation would seem to depend on its power of lessening the activity of the heart and arteries, and thereby moderating the momentum of the circulation, and consequently the general and local irritated condition of the disease.

Among the most important remedies we possess in the early periods of phthisis, are such as operate through the medium of the skin, or such as establish a regular determination to the external surface of the body. *Blisters*, *issues*, or *setons*, can never be properly omitted in incipient consumption. I have repeatedly known the insertion of a caustic issue or a seton on the chest, to remove every symptom of approaching consumption. Even in cases completely developed, counter-irritation, in any of these modes, will generally aid very materially in retarding the progress of the malady. I am disposed to ascribe more remediate power in this affection to setons and issues than to blistering, and of these two, I generally prefer the latter.

Pustulation with tartar emetic, or with the white precipitate ointment, is also a very efficient mode of counter-irritation in this disease. I have seen much benefit derived from both these applications in its incipient stage. When the pustules are formed, emollient poultices should be applied to them, and renewed two or three times daily, until they are healed. Whatever counter-irritating measure be adopted, it should be regularly persevered in, until all the threatening symptoms have entirely disappeared, or its manifest inefficiency be ascertained.

To aid the effects of flannel next the skin, and of a warm and equable temperature in maintaining a regular action of the cutaneous exhalents, advantage may be derived from the use of small portions of *tartar emetic* dissolved in some mild diluent beverage, in the commencement of the disease. A grain or a grain and a half of this antimonial may be dissolved in a pint of gum arabic water, and drank during the day. M. Lenthois of Montpelier, speaks strongly in favour of this remedy in phthisis. His mode of employing it is as follows :—A grain of tartar emetic is to be dissolved in eight table-spoonfuls of water ; this is to be mixed with four quarts of water, or a table-spoonful to the pint, which the patient is directed to use for his common drink at

meals, and at all seasons and hours. Dr. Armstrong directs the use of this article in doses sufficiently large to excite nausea, and occasionally vomiting. "I suspect," he says, "that if a regulated temperature and the exhibition of tartarized antimony were more early and perseveringly employed than they usually are, our success in preventing the development of phthisis might be much greater than it commonly is." The employment of *emetics* in this disease was formerly much recommended by some writers. Dr. Maryatt gave the sulphate of copper and tartar emetic in doses of from two to five grains of the former with two grains of the latter twice a week, and without allowing the patient any kind of drink for several hours afterwards. Dr. Senter advises to give the blue vitriol in conjunction with ipecacuanha (seven grains of each) in the morning before receiving any thing into the stomach, and withholding all kinds of drink for some time afterwards. The account which Lenthois gives of the usefulness of tart. antim. in the present affection is certainly exaggerated; but, although not perhaps of itself sufficient to arrest the progress of incipient phthisis, it deserves, nevertheless, very considerable attention as an auxiliary means. Unquestionably, however, the most efficient of all measures for counteracting the tendency to phthisis, or arresting its development or progress, is a removal to, and residence in, a mild, genial, uniform, and salubrious climate. The influence of such an atmosphere, aided by proper diet, regular and gentle exercise, and external revulsives, with an attention to the hepatic and intestinal functions, will do all, perhaps, that remediate treatment is capable of effecting towards permanently arresting the progress of the disease in its incipient stage. The climates of Naples, of Nice, of Florence, and of Rome, and lately of Egypt, as well as of some of the southern parts of France and Spain, have been particularly recommended to consumptive invalids. Nothing, however, is to be expected from the influence of a warm climate after the disease is once fully developed. It is only in the *incipient* stage of the complaint that any permanent advantages can be obtained from this source, in *scrofulous* phthisis.*

Upon the foregoing remediate measures—namely, occasional small bleedings, external irritating applications, antimonials, a regulated temperature, a simple unirritating diet, and exercise by walking or gestation, our hopes must be mainly placed in our efforts to arrest the disease in its incipient stage. A variety of other remedies have, however, been recommended in this affection; and of these, *prussic acid* has of late years attracted

* See Dr. Carter's "Remarks upon the Effects of a Warm Climate in Pulmonary Consumption and some other Diseases."—*Medico-Chirurg. Transact.* vol. vi. —See also, Medical History of the British Army in Spain.—*Medico-Chirurg. Transact.* vol. vi.

the greatest attention. Could the dose be regulated with any degree of certainty, so as to procure its influence without the risk of dangerous prostration, advantage might, no doubt, be derived from its employment. Possessing, as it does, a direct and most powerful tendency to subdue the irritability and sensibility of the system, it would seem to be peculiarly calculated to do good in the present affection, in which a particularly excitable condition is so conspicuous.

When the disease is once completely established, and purulent expectoration with *hectic* fever has supervened, we can no longer hope to procure a favourable issue by remediate management; and all our efforts must be directed to the palliation of the symptoms and the prolongation of its course. With the exception of depletion, the remedies already mentioned as most apt to arrest incipient consumption or prevent its development, are also among the most useful means in retarding its progress when fully established. When the system is much exhausted in the confirmed stage of the disease, *tonics* are commonly resorted to, but although I have tried them often in scrofulous phthisis, I do not remember having ever derived any obvious advantage from them—but most commonly, they increased the general irritation.* Where it becomes necessary to support the strength of the system, we may allow a more nourishing diet, particularly the more digestible and nourishing kinds of meat—such as tender beef-steak or mutton.

To check the profuse and exhausting night sweats which occur in the advanced periods of the disease, I know of no remedy which is so effectual as the *acetate of lead.* I have frequently prescribed this article with unequivocal benefit in this respect. Four or five grains of the acetate may be taken in the evening. I have known some patients who, after having experienced the relief which it frequently procures, would not do without it. The best mode of giving it is in union with opium. Some of the mineral acids are also recommended for this purpose. Of these, the diluted sulphuric acid, or *elixir* of *vitriol* is the best. Opium is a highly valuable palliative in the advanced stage of phthisis. It generally allays, for a time, the violence and frequency of the cough; tends to diminish the night sweats, as well as the general feelings of distress, illness, and discomfort; and at last, assuages the pangs of approaching dissolution by its soothing and oblivious effects on the nervous system. When opium produces disagreeable effects from idiosyncracy, the *lactucarium* may be

* The tonics most commonly employed in phthisis pulmonalis, are the *misturæ feri compos.*, the quinine, and particularly Dr. Griffith's mixture,—thus: ℞. Myrrh. ʒi. terendo mortario cum spirit. piment. ʒvi. aq. distil. ʒviss. dein adde subcarbon. potassæ ʒss. sulphat. ferri. gr. xii. syrup. ʒil. M. Take ʒii. four times daily.

used in two or three grain doses with excellent effect. We may also employ Dover's powder in union with the extract of hyoscyamus as an anodyne palliative, where opium by itself is objectionable. Six grains of the former with three grains of the latter may be given every night.

Dr. Bourne, professor of the practice of physic in the university of Oxford, speaks strongly in favour of the employment of *uva ursi* in consumption. He asserts, that he cured nine cases out of sixteen, by the use of ten grains of uva ursi with one-third of a grain of opium three times daily. In consumptive symptoms from chronic bronchitis, I have derived much benefit from these two articles given in combination; and the cases related by Mr. Bourne, were probably of this kind.*

Expectorants are sometimes useful to palliate the cough. Flaxseed-tea, decoction of the *lychen icelandicus*, solution of gum arabic, infusion of tussilago or of marshmallows, the camphorated tincture of opium, and syrup of squills in equal proportions, or syrup of poppies with tincture of *tolutan*, may be used for this purpose. Small doses of opium and tartar emetic, as recommended by Pariset, will generally answer very well.†

The inhalation of *tar-fumes* is not adapted to the treatment of tubercular consumption. In the catarrhal variety of the disease, much benefit may be occasionally derived from this and similar inhalations. Nor is mercury a remedy calculated to do good in the present form of phthisis, although much recommended by some practitioners. The cases of consumption which are reported as having yielded to ptyalism were, no doubt, dependent on chronic mucous inflammation, unconnected with a strumous habit or tubercles in the lungs. Too little discrimination was formerly made between the different varieties of pulmonary disease attended with consumptive symptoms; and it is to this circumstance that we may ascribe the discordant and contradictory statements that have been published in relation to the effects of different remedies and modes of treatment.

Laryngeal and tracheal phthisis appear frequently to commence with an obscure inflammation in some part of the larynx or trachea, which may continue for months before ulceration occurs. This incipient stage is characterized by more or less hoarseness, change of voice, and disturbed respiration; and it is only during this early period of the disease, before ulceration has taken place, that any decided and permanent benefit can be derived from re-

* Cases of Consumption, &c. healed by uva ursi, &c. By Dr. Bourne, London, 1806.

† ℞. G. opii gr. x.
Tart. antim. gr. iv.
Conserv. rosar. q. s.
M. Divide into forty pills. S. Take one every four hours.

mediate treatment. Whenever, therefore, we find hoarseness of voice, with cough, disturbed respiration, and a slight prickling pain in the larynx or trachea to continue for some time, particularly when there is no reason to ascribe these symptoms to common cold, we ought immediately to adopt the most active measures for the removal of the affection. Should ulceration not have taken place, we may, perhaps, succeed in preventing it, and in saving the life of the patient. (Armstrong.) One of the most indispensable curative means is a mild and uniform temperature. On no account should the patient be suffered to expose himself to a cold or humid atmosphere. While these precautions are observed, blisters should be applied to the throat, and the blistered surface kept discharging by irritating dressings. Armstrong recommends the use of *balsam copaiba* in the early stage of this variety of the disease. In several cases which have lately come under my care, the use of the muriate of ammonia, according to the formula mentioned at page 95 of this work, appeared to do much good. When the disease arises from syphilis, mercury may be regarded as the principal remedy in conjunction with a regulated temperature and blistering.

In consumptive symptoms from chronic pleuritis, our principal reliance must be placed on external revulsive applications to the chest, the use of calomel so as to produce gentle ptyalism, and diuretic medicines. Blisters or tartar emetic ointment should be repeatedly applied so as to keep up a constant irritation on the external surface of the chest. Internally, we may give calomel and squills in combination, with a view both to a general mercurial impression and the production of diuresis.

CHAPTER XII.

OF THE PHLEGMASIÆ OF THE URINARY AND GENITAL ORGANS.

SECT. I.—*Nephritis.—Inflammation of the Kidneys.*

THE symptoms which characterize acute inflammation of the kidneys, are not in general obscure or equivocal—being usually readily distinguished from those of other painful affections seated in the neighbourhood of these organs. When this affection is excited by cold, it commences commonly like other diseases from this cause, by slight chills and flushes of heat—the febrile reaction preceding the occurrence of pain in the loins. When the disease proceeds from contusions, strains, and irritation of

renal calculi, cantharides, or other irritating substances absorbed into the circulation, or from metastasis of gout and rheumatism, the first intimation of its occurrence is an acute pressing pain in the right or left lumbar region, or in both. The pain* is deep-seated and of a very severe aching character, and but very little aggravated by external pressure. Any sudden concussive motion of the body, however, always increases the pain considerably. The pain often darts down along the ureters,—the testicle of the affected side is retracted towards the abdominal ring, and a sense of numbness is experienced in the thigh. Nausea and vomiting occur in most cases, and violent colic pains in some. The bowels are torpid; the urine is very small in quantity, high-coloured, sometimes tinged with blood; and the desire to void it is frequent, urgent, and troublesome. When both kidneys are inflamed, the secretion of urine is generally almost entirely suppressed;—this, indeed, happens sometimes when the inflammation is seated but in one kidney, the other having its functions disturbed sympathetically.† The patient is easiest when he inclines his body towards the affected side, so as to take off the tension of the lumbar muscles. When in bed, he lies either on the affected side or on the back, with the body inclined towards this side. In some instances, a dull heavy pain is at first felt low down, seemingly where the ureters enter the bladder, and afterwards passes slowly up along the ureter until it reaches the kidney, where it becomes stationary. The pulse in nephritis is full, hard, and frequent, in the early period of the affection; but after the second or third day, it generally becomes smaller and more frequent, particularly where much nausea and vomiting occur. The surface is above the natural standard of temperature, and usually very dry and parched.

Diagnosis.—From inflammation of the psoas muscle, nephritis may be distinguished by the pain in the former affection being always considerably increased on bending the body forwards, whereas, in the latter disease, this position generally lessens the pain. Nephritis is usually attended with more or less nausea and vomiting, and frequent desire to pass off urine, which is not

* W. Bouillaud asserts, contrary to the general statement of pathologists, that pain does not always attend renal inflammation.

† This is always a very unfavourable occurrence. Total or almost entire suppression of the urinary secretion can never continue long in any affection, without adding greatly to the danger of the disease. Complete *ischuria renalis*, even without the irritation of local inflammation, seldom continues beyond four or five days without producing fatal oppression of the brain.—(Sir H. Halford, Transactions of the College of Physicians of London, vol. vi.) There is a case mentioned, however, by Dr. Laing, in vol. x. of the Edin. Med. and Surg. Journal, where the secretion of urine was suspended for nine days without terminating fatally. The great danger of suppression from this secretion in nephritis, was long ago noticed by Aretæus.—*De Causis et signis Morborum, acut.* lib. ii. cap. ix. p. 22.

the case in psoas inflammation, unless the kidneys become affected at the same time. From lumbago, nephritis is distinguished by the paucity of the urine, the disury, the nausea and vomiting, the pain shooting down the ureters in the latter affection; and by the great increase of pain on assuming the erect position, or by any motion of the muscles of the loins in the former, whilst in the latter, little or no increase of pain occurs from these causes.

Nephritis is generally rapid in its course. It seldom continues beyond the seventh day without terminating in resolution or tending to suppuration. When the disease is about terminating favourably by resolution, the fever and pain decline; the skin becomes uniformly moist; the urine is copious, turbid, or charged with mucus; and the nausea and vomiting cease.* The symptoms which denote occurrence of suppuration are—frequent chills or shiverings; a dull, heavy throbbing, instead of the preceding acute pain in the kidney; a slight abatement of the febrile symptoms; and a feeling of heaviness or numbness in the affected part.

In some instances, the abscess bursts into the pelvis of the kidneys and is then discharged with the urine. This is not so favourable an occurrence as might at first sight appear. I have known purulent matter discharged with the urine for upwards of nine months, from a renal abscess. In some instances, more or less pus is discharged with the urine for several years—producing at last hectic and great emaciation, or what has been called *tabes renalis*. A puruloid substance in the urine must not, however, be too hastily pronounced as the result of renal suppuration, or as genuine pus. The irritation of a calculous concretion in the kidneys, will sometimes give rise to a secretion resembling pus; and the same discharge may occur from subacute inflammation of the neck of the bladder. Genuine pus in the urine may generally be distinguished from a puruloid fluid mixed with this secretion, by the former sinking down and forming a thin uniform layer along the bottom of the vessel in which the urine is left standing; whereas, the latter substance remains partly suspended in the urine, and does not settle down into a close layer along the bottom of the vessel.†

In some cases, the abscess points externally, and may be evacuated by an incision into the soft fluctuating tumour. Cases are on record which terminated favourably after the matter had ob-

* *Aetius* says that a watery and pellucid urine, indicates a slow and difficult declension of the disease—aquosæ autem mictiones, et puræ ac pellucentes ægre morbum secerni indicant.—*Sermo.* xi. cap. xvi.

† Van Swieten observes, when the matter comes from the bladder, there is discharged with the urine a sort of foliaceous fragments; but when it proceeds from suppuration in the kidneys, it is more uniformly mixed with the urine.—*Comment.* vol. x. p. 38.

tained exit in this way; but in many instances of this kind, a fistulous opening remains, which it is always extremely difficult and sometimes impossible to heal—the patient gradually sinking under symptoms of hectic.* Authors mention instances of renal abscesses having opened into the intestines; and Richter states, that the matter has found its way into the liver and even into the cavity of the thorax.† Renal abscess has also been known to burst into the cavity of the abdomen, giving rise to rapid and fatal peritonitis;‡ and instances have occurred, in which the matter has passed down along the psoas muscle, and pointed at the upper part of the thigh, like psoas abscess.

Inflammation of the kidneys, occasionally, though rarely, terminates in gangrene. Scirrhus, or induration of the kidneys, also, sometimes results from this affection. Bonetus relates several examples of this kind.§ M. Bouillaud mentions a change of the parenchymatous substance of the kidneys into a tuberculous or encephaloid matter, as the result of renal inflammation; and in several cases he found the structure of this organ converted into a yellowish sebaceous matter.‖

Causes.—From the intimate relation which exists between the kidneys and the skin, *cold* becomes a very frequent cause of this affection. In many instances, it arises from causes acting directly upon the kidneys—such as irritating diuretics, cantharides, turpentine, renal calculi or gravel, contusions, strains, &c.; and in persons subject to gout or rheumatism, the disease sometimes occurs, rapidly and violently, in consequence of metastasis of these affections.

Treatment.—As in all other phlegmasial affections, prompt and efficient blood-letting constitutes the primary remedy in this disease. In addition to general bleeding, *leeching*, or what appears to be better, *cupping* over the lumbar region must not be neglected. Active purgatives also assist materially in reducing the local inflammation. Six or eight grains of calomel, followed in three or four hours by a full dose of castor oil, or three or four pills of the formula given below, will generally answer this purpose well.¶ The bowels must be kept in a loose state by the daily administration of aperients; or by laxative enemata throughout the whole course of the disease. Much relief will sometimes be obtained from anodyne emollient injections, par-

* Hic autem morbus molestus est ex eoque plures ad renum tabem deveniunt. —*Hippocrates, De Intern. Affect.* cap. xvi.

† Specielle Therapie. b. i. p. 615.

‡ Vogel. Handb. t. iv. p. 398.—Richter, Sp. Therap.

§ Sepulchret. Anat. tom. ii.—as quoted by Morgagni.

‖ Observations on the Anatomy and Diseases of the Kidneys, &c. By J. Bouillaud.—*Journal Complementaire.*

¶ ℞. Extract. colocynth. compos. ℈i.
Calomel gr. xii. M.—Divide into six pills.

ticularly in the evening, after the free operation of a purgative. Indeed, the assiduous employment of soothing emollient enemata, either with or without laudanum, is always a most useful auxiliary in the treatment of this affection. For this purpose we may use an infusion of flaxseed, or simply warm water mixed with a portion of milk; or a thin decoction of barley. Fomentations to the external lumbar region will likewise be proper, particularly in the early period of the disease, immediately after leeching or cupping has been practised. A large emollient poultice is a more convenient, and probably a better application for this purpose. *Blisters* are very generally regarded as objectionable in this affection, on account of the tendency of cantharides to irritate the urinary organs when absorbed into the circulation. I have nevertheless derived decided benefit from blistering the region of the inflamed kidney, without having ever known any injurious consequences resulting from it. By suffering the vesicatory to remain no longer than is necessary to inflame the skin —which is seldom more than four or five hours, and then applying an emollient poultice, a full blister will be raised; and I have never known strangury to occur where this mode of vesicating was adopted. I have pursued this practice in ten or twelve cases of nephritis, and generally with evident advantage. *Sinapisms* may also be used, after adequate depletion, with a prospect of benefit; but they are not equal, in efficacy, to blisters, in this as in other internal inflammations.

From the close sympathy which exists between the skin and the kidneys, considerable benefit usually arises from the employment of suitable diaphoretics in this affection. Where the stomach is not too irritable, antimonials* may be employed; but where much nausea and vomiting attend, it will be better to depend on the use of the warm bath, more especially the steam-bath, for the production of diaphoresis. Hot bricks, wrapped in flannels previously moistened with vinegar and water, and laid under the bed-coverings near the patient's body, seldom fail to bring on a more or less copious and uniform perspiration. The nitrate of potash cannot be used with propriety in nephritis, on account of its tendency to excite the activity of the kidneys, an effect which could hardly fail to do mischief in the inflamed state of these organs. All stimulating diuretics indeed must be carefully avoided—copious draughts of mucilaginous

* ℞. Spir. nit. dulc. ʒi.
Vin. antimonii ʒii.
Tinct. opii gr. xxx. M.—S. Take a tea-spoonful every hour or two.
Or,—℞. Spirit mindereri ʒiv.
Tart. antimonii gr. i.
Spir. nit. dulc. ʒii.
Syrup limonis ʒii.
Tinct opii gr. xxx. M.—S. Take a table-spoonful every two hours.

diluents being the only proper means for promoting the urinary secretion. After the inflammatory condition of the system has been in some degree subdued by the antiphlogistic measures already mentioned, small doses of Dover's powder repeated every three or four hours, will tend to keep up a general diaphoresis, as well as to moderate the local pain and general irritable state of the system. Much relief may also be derived after proper depletion and purging, from the occasional use of anodyne enemata.*

A slight sensation of pain and soreness is apt to remain in the affected kidney for several days, and sometimes weeks, after the disease has been subdued. Here *uva ursi*, in conjunction with small doses of opium or Dover's powder, is the best remedy. From twenty to thirty grains of the uva ursi, with the fourth of a grain of opium, or three grains of Dover's powder, may be taken four times daily. This remedy is no less useful in cases where the inflammation has terminated in suppuration. I have known the extract of conium, with an infusion of uva ursi, to be employed in suppuration of the kidney with complete success. Three grains of the extract were taken three times daily, and a wine-glassful of the infusion (one ounce of the uva ursi to a pint of water) every four hours. Minute doses of muriate of mercury with this extract,† have also been found beneficial in abscess of the kidneys. The use of *lime water*, to the extent of from four to six ounces daily, has been recommended in suppuration of the kidneys. (Richter.) Decided benefit has also been derived from the balsam copaiva; but this article must be avoided as long as there is any evidence of inflammatory action present.

Sect. II.—*Cystitis.—Inflammation of the Bladder.*

Symptoms.—Violent burning, lancinating, or throbbing pain in the region of the bladder—extending to the perinæum, and in some instances to the testicles and the upper part of the thighs; attended generally with a sense of constriction in the hypogastric region. The pain is greatly increased by pressure made immediately above the pubis, and the perinæum feels sore to the

* ℞ Pulv. opii gr. ii.
Mucilag. g. arab. ℥ss.
Lactis. tepefact. ℥v. Or,—
℞ Tinct. opii ℥i.
Infusi. lini. ℥vi. M. ft. enema. This injection may be repeated two or three times daily.

† ℞ Muriat. hydrarg. gr. vi.
Extract. conii maculat. ʒiss. M.—Divide into forty-five pills. S. Take one every morning, noon, and evening.

touch. There are frequent, but often ineffectual efforts to void urine, more or less strangury or dysury being usually present. The small portion of urine which passes off is deep red, and often tinged with blood. In some cases there is a constant *stillicidium* of urine. Nausea and vomiting, with great anxiety in the præcordia, are seldom absent in this affection. The bowels are constipated, and there is often a sensation of tenesmus, from the inflammation extending to the lower part of the rectum. The pulse is full, hard, and frequent; the skin hot and dry; the thirst urgent, and the patient is restless and dejected. If the disease continues unchecked in its course, more or less swelling occurs in the loins, with increased tenderness in the hypogastrium and perinæum. Some diversity occurs in the symptoms, according to the particular part of the bladder in which the inflammation chiefly exists. When the neck of the bladder is inflamed, great pain is felt in the perinæum, and total retention of urine sometimes occurs, or the patient is tormented with dysury or incessant feelings of strangury. In this case, the introduction of a catheter or bougie causes extreme suffering. "When the posterior part of the bladder is affected, the rectum suffers more particularly, and the patient is harassed by a most distressing and constant tenesmus. Sometimes the inflammation occupies that part of the bladder in which the mouths of the ureters are situated, which thus become involved in the affection, and a suppression of urine, more or less complete, and its consequences, take place; in this case, there is commonly more or less pain and tenderness on pressure in the hypogastric region." (Prout.)

Like other inflammations, cystitis terminates either in resolution, suppuration, gangrene, or induration and thickening of the coats of the bladder. Resolution, besides the abatement of the pain and fever, is attended with general and uniform diaphoresis; a turbid and rather copious urine, passed with little or no pain; and an ability to bear pressure on the epigastrium and perinæum. On dissection, the inner membrane of the bladder is generally found minutely injected, so as to give a uniform red appearance to the whole surface. In some instances, the inflammation is confined entirely to the internal coat; in others, it extends to the muscular tunic; and sometimes even to the peritoneal covering.*

Suppuration is not a frequent termination of this affection. (Richter.) Abatement of the violence of the fever and pain, accompanied with chills or rigors, and the sudden appearance of a white matter in the urine, indicate the occurrence of suppuration. In some instances, abscesses are formed in the coats of the blad-

* Wilson on the Urinary Organs, p. 297.

der, particularly near its neck; and in others, the abscess forms in the cellular structure surrounding the neck of the bladder. When suppuration occurs in the mucous membrane, or when the abscess between the tunics of the bladder bursts into its cavity, the matter will be discharged with the urine. Sometimes the abscess points externally, and may open into the rectum or vagina, or sink down and infiltrate into the cellular membrane of the pelvis. The abscess has also been known to burst into the cavity of the peritoneum; and the matter has made its way into the labia pudendi, and the loose structure of the scrotum.

In some cases, the coats of the bladder are thickened and indurated, particularly the internal one. Sometimes fungoid elevations of the mucous membrane occur; at others, indurations are found in different parts, resembling small scirrhous tumours, and some of these are occasionally ulcerated. Firm adhesions have been noticed between the bladder and rectum, as well as between the bladder and uterus, in consequence of acute cystitis. It is sometimes very difficult to distinguish some of these results of inflammation of the bladder during life from calculus.

Gangrene is a frequent termination of cystitis. The majority of instances that prove fatal within the first six or seven days, terminate in gangrene. The occurrence of gangrene is announced by sudden cessation of the pain; cold extremities; profuse and clammy perspiration; great prostration of strength; a cadaverous expression of the countenance; slight confusion of the mind; a small, frequent, and weak pulse; and hiccough.

Causes.—Cystitis may be produced by mechanical irritating substances in the bladder; retained urine; external injuries on the hypogastric region; irritation from acrid substances absorbed and conveyed to the bladder—as cantharides, turpentine, &c.; metastasis of gout and rheumatism; irritating injections forced into the bladder; irritation from the introduction of a bougie, or catheter; gonorrhœa; suppression of hæmorrhoidal discharge, and of perspiration; cold applied to the feet or lower portion of the abdomen; injury sustained in parturition, or from the use of obstetrical instruments.

Treatment.—Acute cystitis is a rapid and highly dangerous affection, and must be promptly met with the most efficient antiphlogistic measures. Efficient blood-letting must be early practised, until the activity of the pulse is moderated. After general bleeding, *leeching* is of the utmost importance in this affection. The leeches must be applied to the perinæum, about the anus, and to the hypogastric region; and, when the pulse will admit of it, they should be reapplied. Immediately after leeching, an emollient poultice should be applied over the hypogastrium, pubis, and perinæum. The bowels must be kept open by gentle laxatives and mucilaginous enemata. Much relief is commonly

obtained from an emollient anodyne enema, immediately after the rectum has been emptied by a laxative. Attention must be early paid to the evacuation of the urine, should the bladder be found distended by it. Great care, however, is required to avoid all unnecessary irritation from the introduction of the catheter. When the neck of the bladder is inflamed, the pain caused by this operation is generally extremely severe, and it is sometimes impossible to reach the bladder, from the great irritability and spasmodic contraction of its neck. This can, in some degree, be obviated by introducing three or four grains of opium into the rectum an hour before the catheter is used, accompanied with an efficient abstraction of blood, both by venesection and leeching. To promote the action of the cutaneous exhalents, we may employ the warm bath; or, what is better, the steam-bath, as mentioned under the head of nephritis. Some of the milder diaphoretics, such as spiritus mindereri, diluted with barley-water or flaxseed tea; or small and frequent doses of pulvis antimonialis; or of Dover's powders, may be usefully exhibited, with a similar view. The hip-bath is particularly recommended by Richter as a local application in this affection. After the violence of the local and general inflammatory action has been moderated by the foregoing means, much benefit may sometimes be derived from the internal use of opium and calomel.

Richter observes, that opium is a primary remedy in cystitis, particularly when given in union with mercury. Prout also recommends the internal use of this combination. A grain of opium, with two grains of calomel, may be given every four hours. In cases of a *subacute* character, the employment of opium and calomel, in conjunction with leeching, emollient anodyne injections, and fomentations or poultices to the hypogastrium and perinæum, is particularly beneficial. Nitre and blisters are apt to increase the local irritation, and cannot, therefore, be resorted to without considerable risk of doing injury. "If blisters be employed," says Prout, "they should be used with caution and permitted to remain only for a short time, and afterwards such dressings applied as tend to keep them open." The mode of blistering mentioned, when speaking of the treatment of nephritis, may, perhaps, be safely adopted in this affection. Considerable advantage is said to accrue from the repeated injection of mucilaginous fluids into the bladder, by obtunding the acrimony of the urine, and soothing irritation.

Sect. III.—*Chronic Cystitis.*

Chronic inflammation of the inner membrane of the bladder is not an uncommon affection, and is generally described under

the name of *cystirrhœa.* In some instances, this affection is the consequence of acute cystitis; but it may arise, at once, from the action of the same causes which produce acute inflammation of the bladder. The symptoms which accompany chronic mucous inflammation of the bladder, are—slight lancinating pains, attended with a sense of heat or burning in the region of the bladder, and a feeling of weight and tenderness in the perinæum; frequent and harassing desire to pass urine, with occasional spasmodic action of the bladder and urethra. The urine is loaded with more or less of a tenacious mucus. Slow fever generally attends, accompanied with thirst; general debility, "particularly about the back and loins;" and, in protracted cases, much emaciation and exhaustion occur. There is generally considerable derangement of the digestive functions; loss of appetite; sometimes nausea and vomiting; costiveness; tongue covered with a white or brown fur; and the skin is harsh and dry. "In slight and incipient cases of this affection, the urine, when first passed, generally appears of a whitish colour, and is more or less opaque and turbid, with the appearance of flocculi floating through it. On standing, however, for some time, it becomes more or less transparent, and the mucus will be found together in a mass at the bottom of the vessel."—(Prout.) The writer just quoted states, that in most cases the urine is *acid;* but others assert that it commonly exhales an ammoniacal odour, and that it is rarely acid. In some cases the quantity of mucus discharged with the urine "is enormous, amounting occasionally to several pints in the day; and in this case it not only comes away diffused through the urine, but also in the form of large coagula, which, by blocking up the urethra, give origin to the most distressing symptoms—particularly to a sense of severe burning pain along the whole course of the urethra." Sometimes this mucus is easily diffused in water or the urine; but in inveterate and violent cases, it is so extremely tenacious, that it is very difficult to mix it with the urine. When suffered to cool, the mucus, says Prout, is sometimes so tenacious "that it may be drawn into strings of considerable length, and the vessel may be frequently inverted without its falling out." In the worst cases, particularly when ulceration of the inner surface of the bladder exists, copious discharges of blood, at times, take place. I have known an instance of this disease which continued for five or six years, and at last terminated fatally, from the supervention of acute inflammation in consequence of irritating injections. In this case, more or less hæmorrhage occurred from the bladder almost every month. The discharge of mucus was always very considerable. On dissection, two large ulcers of the mucous membrane were found near the neck of the bladder. Dr. M'Dowell found, in this affection, the mucous surface of the bladder to present "different degrees of vascularity,

from merely a few patches of a dark or bright red colour to an entire vascularity, in some cases so marked, as to appear as if the bladder had been daubed over with blood; the veins in general are turgid; the membrane much thickened; frequently numerous ulcers occur, covered with a tenacious brownish coloured lymph; these are sometimes deep and numerous, so as to give a honey-comb appearance to the membrane. The inflammation sometimes ends in complete sphacelus of the interior of the bladder."* "Blood," says Dr. M'D., "is often discharged in very large quantity; and, together with the abundant mucus, a white powdery sediment, or sanious matter, is mixed with the urine."

This affection is most apt to occur in old and gouty subjects; and persons of an irritable and scrofulous habit are said to be particularly predisposed to it, "more especially if they have been accustomed to free living, or been given to venereal excesses, or have suffered from these affections or gout."

Treatment.—In the early stages of the complaint, we must endeavour to reduce the chronic inflammation by local, depleting, and counter-irritating measures. Cupping along the loins, with the occasional application of leeches to the perinæum, and about the anus, may be accounted our most efficient remedies during the first period of the disease. If the pulse is active, and the pain in the pelvis considerable, general blood-letting may be very beneficially resorted to. The bowels must be kept in a relaxed state by the occasional use of gentle purgatives, such as castor oil, or magnesia. I have known much benefit to result from a caustic issue on the upper and inner part of the thigh. Advantage would probably be derived also from frictions and pustulation with tartar-emetic ointment on the upper part of the thighs, or on the loins. When the general and inflammatory symptoms have subsided, either in consequence of the application of the remedies just stated, or by the long continuance of the disease, astringents, with some of the narcotic extracts, may be resorted to with a prospect of advantage. Dr. Prout prefers the uva ursi to all other articles of the astringent kind in this affection. "Given in combination with hyoscyamus, and steadily persevered in *for a considerable time*, the uva ursi seldom fails to diminish the irritation and quantity of mucus, and thus to mitigate the patient's sufferings." Within the last five or six years, the *buchu* leaves (diosma crenata,) have been strongly recommended to the profession as a valuable remedy in this and other chronic affections of the bladder. Dr. M'Dowell employed it successfully in three cases, according to the following formula:

* Dublin Transactions, vol. iv.

℞. Infus. buchu ℥vii.
Tinct. ejusdem
——— cubebæ āā ℥i. M.—S. Take an ounce of this mixture three times daily. The use of this remedy should be continued for three or four months.

I have heard of the successful employment of an infusion of the *pipsissewa*, (chimaphila umbellata,) in a case of this disease. In several inveterate cases I have prescribed the muriated tincture of iron, with infusion of peach-leaves, with very manifest benefit. In one instance, a perfect cure was effected by the tincture of iron, in conjunction with uva ursi. Frictions over the groins and the hypogastrium with camphorated oil has appeared to me serviceable in some cases. Besides these, a great variety of other remedies have been recommended for the cure of this affection. Balsam copaiva; turpentine; balsam peru; camphor; madder; and many of the vegetable astringents are mentioned by writers as often beneficial in this complaint. From the known good effects of balsam copaiva in chronic inflammation of mucous membranes, there is some reason to presume that advantage might be obtained from its use in this complaint. Experience does not, however, furnish us with much testimony in its favour. I have given it in a few cases, but in these it appeared to give additional uneasiness in the bladder, without diminishing the mucous discharge.

Different kinds of injections into the bladder have also been recommended as beneficial in this affection; such as flaxseed tea; infusion of marsh-mallows; or barley-water. When retention of the urine occurs from a spasmodic constriction of the neck of the bladder, relief will often be obtained from seven or eight drops of the muriated tincture of iron given every half hour. The diet should be simple and digestible, and every kind of stimulating beverage carefully avoided. Fatiguing exercise, or riding on horseback, or in a carriage over rough roads, usually aggravates the symptoms. The drink should be bland and mucilaginous. One patient under my care, always felt himself much relieved by drinking the infusion of the *malva rotundifolia*, a common plant in this country. I have also prescribed the constant use of slippery elm bark tea with beneficial effect.

Sect. IV.—*Hysteritis.—Inflammation of the Womb.*

Acute inflammation of the uterus, generally occurs in the puerperal state, and usually within a few days after parturition. Sometimes this affection commences with rigors, succeeded by fever, before any pain is experienced in the uterus; and at others, more or less severe pain in the region of the uterus is the first intimation of its occurrence. The characteristic symptoms of

the disease are: a fixed, continuous, lancinating, or a dull and aching pain in the pelvis, greatly increased by pressure or motion, and accompanied with a sense of weight or bearing down in the perinæum. The urine is generally passed with much pain and difficulty, and in some cases a total retention takes place. This is particularly apt to be the case when the anterior and lower portion of the womb is inflamed. When the inflammation is chiefly located in the posterior part of the uterus, the pain is particularly severe in the region of the sacrum, and the patient experiences much pain, and often tenesmus, in evacuating the bowels. Sometimes the pains extend to the iliac regions, to the hips, and down the thighs to the knees, and even to the feet. When the pains extend to these parts, the lateral portions of the womb are usually the principal seat of the inflammation.

In the early period of the disease, little or no swelling of the abdomen occurs, but on examining the pubic region externally with the hand, the uterus is always found considerably enlarged, firm, and exceedingly tender to the touch. In those cases that occur soon after delivery, the pain in the pelvis generally becomes much increased, at times, in consequence of the occasional contraction of the uterus, and may be mistaken for severe *after-pains*. To distinguish the inflammatory pains from the latter, however, it is only necessary to bear in mind, that the former are always continuous, though occasionally aggravated, whereas the after-pains are intermitting.

In the majority of instances, the system generally sympathizes strongly with the inflamed organ. In the early period of the disease, nausea, with occasional vomiting occurs;*—the pulse, in some cases, is full, strong, and hard; in other instances, it is small, contracted, quick, and frequent. Severe headach is a very common attendant, and towards evening, and at night, more or less delirium usually occurs. In a great majority of cases, the lochia are entirely suppressed; in some instances a slight lochial discharge continues throughout the disease, and occasionally, though extremely seldom, this evacuation is even profuse. In general, the secretion of milk is somewhat diminished, but it rarely becomes entirely suppressed, as in puerperal peritonitis. In some cases of hysteritis, indeed, the breasts remain full and turgid with milk, during the whole course of the disease. The bowels are generally inactive, and the urine is small in quantity, of a deep red colour, and usually passed with much difficulty and pain.

* Dr. Dewees observes, in his account of the symptoms of this affection, that "the stomach is rarely much affected in the early part of the disease—at least vomiting seldom takes place." This does not accord with my own experience. In all the cases of unequivocal hysteritis I have ever met with, nausea, with occasional retching, occurred during the early period of the malady.

The course of hysteritis is generally rapid. If, after four or five days continuance, it do not tend to resolution, it will most probably terminate in suppuration or gangrene. By a vigorous antiphlogistic treatment, however, the violence of the inflammation may often be broken down in the course of the first twenty-four hours, and resolution speedily established. When the inflammation tends to this favourable termination, the pain, tenderness, and swelling of the uterus abate—the pulse becomes slower, soft, and open; the skin relaxed and moist; the tongue clean and humid; and the headach and general uneasiness gradually disappear. The lochia, also, usually begin to flow more freely, and the urine becomes more copious and natural in its appearance.

The occurrence of suppuration in the substance of the uterus, is always attended with great danger. If the abscess bursts into the cavity of the peritoneum, or makes its way between this membrane and the external surface of the womb, into the cellular texture of the lower part of the pelvis, the issue will almost inevitably be fatal. Sometimes the abscess opens into the uterus, and the matter is discharged by the vagina. When the pus is evacuated in this way, the probability of a favourable termination will be very considerable. I have seen an instance where the uterine abscess formed adhesions with the peritoneum in the groin, and, after three weeks, the tumour was opened externally, and exit given to the matter. This patient finally recovered her health. Raiman states, that the abscess has, in some instances, burst into the bladder,* and cases are related, in which the matter was evacuated through the rectum. The occurrence of suppuration may be suspected, when, after an obstinate course of the disease, for five or six days, the pains become less severe, with a feeling of weight in the affected part, at the same time that the pulse becomes more frequent, attended with occasional slight chills; irregular distribution of heat over the body—some parts being cool while others are hot; irregular, partial, and cool sweats; fetid, and more abundant lochia; prostration of the muscular power; dry and red tongue, and a livid flush on one or both cheeks.

The termination in gangrene is not a frequent event in this affection, unless the peritoneum be implicated in the inflammation. The supervention of gangrene will be readily perceived by the occurrence of the usual symptoms of mortification. A rapid cessation of the pain; great muscular prostration; dimness of vision; a death-like countenance; a profuse, cold, and clammy sweat; ice-cold extremities; and an extremely small, weak, and rapid pulse, announce the occurrence of gangrene, and the inevitable doom of the patient.

* Handbuch der Speciellen Med. Pathologie, &c. B. i. p. 358.

The foregoing description applies to hysteritis in its simple or unmixed form—that is, inflammation of the proper substance of the uterus, without implicating its peritoneal covering in the disease. In many instances, however, the inflammation spreads to the peritoneum,—an extension of the local affection frequently met with in the worst forms of what is usually called *puerperal fever*. Cases of this kind almost invariably prove fatal. The extension of the inflammation from the substance of the uterus to the peritoneum, is attended with an increased frequency of the pulse, tumefaction, and great tenderness of the lower part of the abdomen; entire suppression of the lochia, "or an excessive discharge of them;"—(Dewees,) cessation of the secretion of milk; great prostration of the muscular powers; frequent muttering delirium; constant recumbence on the back, with the knees drawn up and raised, and the shoulders elevated, to take off the tension of the abdominal muscles; a dry, coated, and brown tongue; and, towards the end, usually, diarrhœa. Cases of this kind are always rapid in their progress, and unless the inflammation be speedily subdued by prompt and energetic measures, collapse of the vital energies generally supervenes in forty-eight hours, and often sooner, from the time the peritoneal inflammation commences.

Treatment.—The most efficient antiphlogistic means must be promptly and energetically pursued in the treatment of this affection. As soon as possible after the commencement of the inflammation, blood should be drawn from a vein to the extent of producing a very decided impression on the circulation, or an approach to syncope. If after the first efficient bleeding, the pulse rises again, and the pain and tenderness of the parts are not materially abated, venesection should be repeated, and again to the extent of causing a very manifest reduction of the momentum of the circulation. When the activity of the heart and arteries has been moderated by general bleeding, and the disease is not adequately subdued, leeches should be applied over the region of the pubes, and to the vulva and perinæum. Immediately after leeching, a large emollient poultice should be applied over the lower part of the abdomen and the external organs of generation; and this application should, from time to time, be repeated, until the violence of the local affection is in a great measure subdued. Dr. Dewees objects to the use of fomentations to the abdomen, in this affection, and asserts that they have done mischief. I have no experience with any applications of this kind, in the present malady, except emollient poultices applied after efficient venesection and leeching; and to me it has always appeared, that very evident advantage was obtained from this application.

Purgatives are, in general, highly useful in hysteritis. Calo-

mel, in doses of from eight to twelve grains, followed in the course of four hours by a full dose of Epsom or Glauber's salt, will answer this purpose very well. After the first active purgative, two or three evacuations should be procured daily by the exhibition of small doses of calomel and of the neutral purgative salts. Irritating purgative enemata, generally, aggravate the patient's sufferings, and should not be employed. I have, however, known unequivocal benefit derived from injecting into the rectum from time to time, warm emollient fluids,—such as warm water and milk—decoction of althea—infusion of flaxseed —or simply warm water. In a case which I attended about two years ago, the patient was much relieved by injections of this kind. They are particularly beneficial in the declension of the disease.

Blisters are much recommended by some writers; but Dr. Dewees thinks their usefulness is very doubtful. From my own experience, I am disposed to ascribe considerable value to vesication in this affection. When employed, after the momentum of the circulation has been moderated by general and local bleeding, I am well satisfied that blisters will often do much good in this complaint. If after leeching we apply an emollient poultice over the lower part of the abdomen and vulva, and blisters to the upper and internal part of the thighs, much advantage will in general result.

Some benefit may also be obtained from the usual antiphlogistic diaphoretic remedies. Nitre, antimony and calomel in combination, forms an excellent compound for this purpose. The muriate of ammonia, as prescribed under the head of intermitting fever, is a favourite remedy with many of the German physicians, and I am inclined to think that it is very worthy of attention in this respect.

Opium, in full and frequent doses, and in union with calomel, is a valuable remedy in this affection. Dr. Dewees, however, "thinks that in this, as well as in all diseases of high inflammatory action, opium is decidedly hurtful." My own experience has led me to a very different opinion. The powers of this narcotic in inflammatory affections are not as yet sufficiently appreciated. That opium is not hurtful, "in all diseases of high inflammatory action," but often highly beneficial, is admitted by many of the ablest practitioners of the present day. When given in active doses, and repeated so as to keep the system constantly under its full influence, it often contributes in a powerful degree to the reduction of the local and general phlogistic actions. By lessening the general irritability and sensibility of the system, the different organs and structures become less susceptible of the stimulus of the local inflammation, and all the sympathetic actions consequently abate in their violence;

and, in like manner, by diminishing the morbid sensibility, and pain of the affected part, the inflamed capillaries will be more disposed to resume their healthy functions. Opium does not, generally, increase the momentum of the circulation, in fevers *depending on local inflammation*. I have frequently known, in violent cases of acute rheumatism, a full dose of opium to render the pulse less frequent, and much softer than it was before its exhibition. As this article, however, has a strong tendency to cause cephalic congestion, and may do injury in this way, where the system is plethoric, or the action of the heart and arteries very vigorous, it will always be best to delay its exhibition, until blood has been efficiently abstracted. When this has been done, and the bowels well evacuated, from one to two grains of opium, with the same quantity of calomel, may be given every three or four hours with the happiest effect in the present disease.

Sect. V.—*Chronic Inflammation of the Uterus.*

Chronic inflammation of the uterus, appears to be a very common affection; and, though frequently productive of very distressing consequences, is often misunderstood and consequently mismanaged.

This affection is frequently the result of difficult or instrumental labours; and Mr. Guilbert observes, that it often arises from excessive venereal indulgence; and from rheumatic and gouty irritation. He mentions also, translation of erysipelas as a frequent cause of the disease; and it supervenes occasionally, in consequence of the final cessation of the menses, at the critical period of life, and even as the result of temporary amenorrhœa. Chronic inflammation of the womb, sometimes occurs in a periodical manner, and this is most apt to be the case, when it arises from erysipelas. Mr. Guilbert says, that females who do not suckle their infants, are more liable to this variety of uterine disease, than those who perform this interesting maternal function.

Chronic inflammation sometimes affects the whole body of the uterus; but much more frequently, it is seated in the neck or mouth of this organ. Out of a hundred cases, says the author just mentioned, there will, probably, not be ten in which the inflammation is not almost exclusively seated in the neck and mouth of the womb.

Many females affected in this way, either mistake their complaint, or conceal it; or from the slightness of their sufferings neglect to resort to medical aid, until serious, and often irremediable structural disease is established. Some experience only

a sense of heat, with slight soreness in the lower part of the pelvis; others complain of dull or lancinating pains in the region of the womb, with occasional intermissions and exacerbations. In some cases a sense of weight is felt, as if the uterus were prolapsed, attended with occasional pains in the upper part of the vagina. In all instances, more or less of a leucorrhœal discharge attends; and when, at times, the inflammation is aggravated, this discharge becomes white and opaque, or purulent. Those who are affected in this way are apt to experience considerable pain at the superior part of the vagina, during the venereal embrace; and, in some instances, the tenderness of the os uteri is so great, that the venereal act always causes extreme suffering.

On examining per vaginam, the mouth of the womb is found irregularly enlarged, one side or lip being usually much swollen, and very tender to the touch. So great is the sensibility of this part, that the patient experiences severe suffering from the slightest touch of the finger on making the examination. In general, the mouth of the uterus is diverted from its regular position in the vagina, and directed to one side, or sometimes to the posterior or anterior part of the pelvis. If the disease has been of long standing, the engorgement, or swelling of the neck of the womb, is so great, as to form a large tumour embraced by the vagina. More or less pain in the back and loins occurs in nearly all cases; and the stomach usually sympathizes with the uterus, so as to give rise to a train of very harassing dyspeptic and nervous symptoms.

In some cases, the inflammation continues for years, without the occurrence of any serious structural disorder of the womb; but in the majority of cases, the neck of this organ gradually enlarges, and becomes indurated, or scirrhous, and finally, often terminates in cancerous ulceration.

Many cases, that are usually regarded as simple leucorrhœa, are connected with chronic inflammation of the os uteri; and it is hence especially important, when called to prescribe for morbid vaginal discharges of a leucorrhœal character, to ascertain, by examination, the state of the neck and mouth of the uterus. The existence of inflammation and tumefaction may be suspected, when with a puruloid vaginal discharge, the patient complains of heat, weight, soreness, or pain in the upper part of the vagina.

Treatment. When the pulse is irritated, or quick, frequent, and somewhat tense, it will, in general, be proper to draw blood from a vein—and this measure is particularly proper when the patient is of a robust and plethoric habit. The diet should be unirritating and digestible, and where the diathesis is manifestly phlogistic, the nourishment should be of the lightest kind, until the general irritated condition of the system is removed. When

there is reason to believe that the bowels are loaded with feculent matter, a few active purgatives ought to be administered in the beginning of the treatment; but after the intestines have been thus thoroughly evacuated, small doses of some of the neutral purgative salts should be given two or three times a week, so as to keep up a gentle and regular action of the bowels. Much benefit is sometimes derived from the application of leeches to the perinæum, and about the anus and vulva, or even to the region of the pubis. Mr. Guilbert, in the work referred to above, speaks in the most favourable terms of the efficacy of leeches applied to the os uteri.* He has invented a speculum uteri, by which, he says, the application of leeches to this part is very easily effected; and he has given the history of several cases, in which this practice was adopted with prompt and complete success. That local depletion, in this way, is likely to do much good, we cannot doubt. In private practice, however, it would be difficult to induce patients to submit to this treatment; and there are few practitioners, I apprehend, who would be willing even to propose this measure, unless the urgency of the case were extremely great.

Cupping above the pubis, and blisters applied to the sacrum, or to the internal surface of the thighs, will sometimes contribute materially to the reduction of the uterine inflammation. Some advantage may also be obtained from warm emollient injections into the vagina, but all astringent and exciting applications of this kind ought to be carefully avoided, with the exception, perhaps, of a very weak solution of sugar of lead.

Internally we may employ small doses of balsam copaiva, but its use must be delayed until the measures already mentioned have, in some degree, moderated the local and general irritation. I have, in a few instances, derived considerable benefit from the internal use of the muriate of ammonia, in twenty grain doses, three times daily. When this article is dissolved in water, with a considerable portion of the extract of liquorice, it will, in general, be readily taken by patients; but without the addition of the liquorice, it is so extremely offensive to the taste, that very few are willing to employ it.

If, after the inflammation, or the pain, tenderness and swelling of the neck or orifice of the womb are removed, a leucorrhœal discharge continues, it must be treated according to the directions given under the head of leucorrhœa, in the second volume.

* Considérations pratiques sur les Affections de l'utérus. Par J. N. Guilbert, M. D. &c. Paris, 1826.

CHAPTER XIII.

OF THE PHLEGMASIÆ OF THE SANGUIFEROUS SYSTEM.

Pericarditis.

Inflammation of the pericardium is no very uncommon affection, and from the very important functions assigned to the parts immediately implicated, must be regarded as one of the most alarming and dangerous of phlegmasial diseases.

The symptoms which usually attend the *acute* form of the disease, are—sudden severe lancinating pains in the centre or cardiac region of the chest, extending occasionally to the epigastrium, or to the back between the shoulders, attended with more or less oppressive dyspnœa, palpitation of the heart, and a sense of weight and constriction under the sternum and left side of the thorax. In most instances the patient is entirely incapable of lying down, more especially on the left side. He is constrained to remain, almost immoveably, in the sitting posture, leaning the body slightly forwards, and resting his head on the back of a chair or some other sufficiently elevated support. The slightest variation from this posture, unless very cautiously effected, is apt, in some cases of this kind, to give rise to sudden and most poignant pains in the region of the heart. Extreme præcordial anxiety, with a dry and short cough, usually attend; and in many instances, partial syncope or sudden feelings of great faintness occur, at intervals, during the progress of the disease. Along with these symptoms we have also strong evidence of cardial disturbance in the state of the pulse. In most instances, the pulse is remarkably irregular, intermitting, frequently feeble, and sometimes so small as to be almost imperceptible. A few cases, indeed, have been recorded, in which the pulse remained in nearly a natural state. Tacheron relates an instance of this kind.* The face is generally pale, with an occasional circumscribed flush on one cheek; the prolabia become more or less livid as the disease advances, and a slight puffy swelling is apt to occur about the eyes and temples. The hands and feet usually become slightly œdematous in the latter stage of the disease; and great general weakness almost always ensues soon after the full development of the inflammation. The speech is commonly faltering, and in some cases the patient is unable

* Recherches Anatomico-pathologiques, &c. &c.

to spit out, without giving rise to sudden and extremely severe darting pains in the region of the inflamed organ. Sometimes considerable headach attends, and occasionally much uneasiness and pain is experienced in the stomach, accompanied with tenderness to pressure in the epigastrium.

It must not be supposed, however, that pericardial inflammation is invariably attended with the train of symptoms just described. There are few phlegmasial affections so liable to such remarkable variations in the attending symptoms, as the disease under consideration. In some cases very little or no pain is experienced in the region of the heart; and the disturbance of the heart's action varies greatly in different cases, or at different stages of the same case. Most commonly the heart palpitates tumultuously, and knocks violently against the ribs; but in some cases, its action is so feeble that its pulsations are scarcely to be felt or heard. Although the majority of patients are obliged to remain in a sitting or semi-recumbent posture, yet some are forced to lie immoveably on their backs, or on the right or left side. "But the strangest anomaly is, that the same patient who at one period of his disease has fixed himself immoveably on the left side, will, at another, be forced to turn over and fix himself as immoveably on the right side." (*Latham.*)

Pericarditis is not unfrequently complicated with inflammation of the neighbouring structures, as the pleura, lungs, mediastinum, diaphragm, or stomach; and in some cases the substance of the heart itself participates in the pericardial inflammation. In instances of this kind, the symptoms are, of course, correspondingly complex.

Diagnosis. From the complications just mentioned, the diagnosis of pericarditis is often attended with much difficulty; and Laennec cautions, in all instances, against "too implicit a confidence" in the symptoms mentioned above as manifestations of pericardial inflammation. Pericarditis, he says, may exist without any of these signs; and on the other hand, all of them may be present, without the slightest inflammation of the pericardium. M. Louis, however, asserts, that from a careful observation of thirty-two cases of this affection, he has been led to believe that the diagnosis is by no means so difficult and uncertain as is supposed by Laennec and others. This, he says, may be asserted, at least, of those cases that are free from complications. Where we find severe lancinating pains in the region of the heart, extending at intervals to the back and epigastrium, attended with palpitation of the heart; great irregularity, intermission, and smallness of the pulse; difficult respiration; occasional syncope or great faintness; inability to rest in the recumbent position, with more or less œdema of the extremities, we may infer, without much risk of erring, the existence of pericardial inflammation.

If with these symptoms we find the cardiac region yielding an obscure or dull sound on percussion, while the other parts of the chest are resonant, the correctness of the diagnosis will hardly admit of a justifiable doubt. But, although we may, with but little risk of mistake, infer the existence of pericarditis when the foregoing symptoms are present, it is well ascertained that rapid and violent pericardial inflammation sometimes occurs, and proceeds to a fatal termination, without at any period of its course manifesting a single symptom indicative of cardial disease. It is a very remarkable fact also, that cases of this kind occasionally simulate inflammation of the brain so closely, that no one could for a moment hesitate to regard the disease as an instance of strongly marked encephalic inflammation. Dr. Latham has recorded several highly interesting cases of this kind. "One of the children at Christ's Hospital, had in the opinion of all who saw him the severest inflammation of the brain. The attack was sudden, with great heat of the skin and frequency of the pulse. He had delirium and convulsions, and pointed to the head as the seat of his pain." On dissection, not the slightest trace of inflammation within the head was discovered, but the heart and pericardium were intensely inflamed. M. Andral also relates a case where delirium, general convulsions, twitching of the tendons, and finally tetanic spasms, followed by paralysis of the upper extremities and fatal coma, occurred without the least sign of any particular affection of the heart. On dissection, the brain, spinal marrow, and their membranes, did not present the slightest traces of disease. But the pericardium exhibited strong marks of inflammation; its surface was covered with a layer of concreted lymph, and several ounces of a green and flaky serum was effused into its cavity.*

Causes. In general, whatever is capable of causing inflammation of any of the thoracic organs or structures, may give rise to pericarditis. Cold; mechanical injuries; the sudden healing up of old ulcers; the suppression of habitual evacuations; repelled cutaneous affections; the influence of the depressing mental emotions; and over exertion of the mind; may produce the disease. Metastasis of *rheumatism* and gout, is, however, by far the most common cause of this affection. Rheumatic irritation especially, is frequently concerned in the production of cardiac affections. Under the head of hypertrophy, its tendency in this way will be particularly noticed. Pleuritis and pneumonia sometimes involve the pericardium.

Autopsic phenomena. In most instances a considerable quantity of serum is found in the pericardium. Louis mentions cases

* Pathological Essays on some of the Diseases of the Heart. By P. M. Latham, M. D. Physician to St. Bartholomew's Hospital. Lond. Med. Gazette, 1829.

in which more than a pint and a half of reddish or yellowish serum was collected; and Corvisart saw an instance where it amounted to four pounds. The internal surface of the pericardium is generally much injected, and often rough and uneven, or covered with more or less extensive patches of false membrane. In some cases a similar pseudo-membranous formation covers the surface of the heart. M. Louis mentions one where false membrane, nearly half an inch thick in some places, covered the heart, so as to give it the appearance of the rind of a pine apple. Laennec asserts that the quantity of serum effused into the pericardium, though considerable in the early stage of the disease, always decreases progressively, by absorption, as the violence of the inflammation declines. In cases of great violence, there is generally very little or no serum effused; but instead of this, a large portion of firmly concreted albumen usually covers the heart and internal surface of the pericardium, and in some instances, fills the whole cavity of this membrane, uniting it more or less firmly with the surface of the heart.* In cases that terminate favourably, this albumenoid concrete matter gradually becomes converted into cellular substance, "or rather into laminæ of the same nature as the serous membranes." In some cases the pericardium is found very firmly adherent to the heart throughout its whole extent, by means of laminæ of cellular structure thus formed. Cases are mentioned by some of the older writers, where the pericardium was supposed to be altogether wanting; but these were no doubt instances of firm adhesion of this membrane to the heart. Columbus relates the case of a student at Rome, who after having for a long time suffered frequent attacks of syncope, died suddenly. On dissection, the heart, he says, was found unprotected with a pericardium.† The pericardium has also been found affected with true scirrhous induration; and Dr. Friend asserts that he has found it above half an inch in thickness throughout its whole extent.‡

Chronic Pericarditis. The chronic form of pericardial inflammation appears to be much more frequent than the acute. It is attended, in most instances, with more or less fixed pain in the region of the heart, subject to occasional exacerbations, particularly from even slight perturbating causes. Some degree of dyspnœa and pectoral oppression is seldom wholly absent; and a short dry cough is apt to occur. The pulse, as in the acute form of the complaint, is small, and at times irregular and intermitting; and the heart is apt to be thrown into violent paroxysms of palpitation by slight corporeal exertions and mental excitement. Patients labouring under this affection, are generally

* Laennec.

† De Re Anatomica. lib. xv. p. 267—as quoted by Van Swieten.

‡ History of Physick, p. 2.

timid, pusillanimous, and disturbed by apprehensions of evil, or of death. On percussion, the sound elicited over the region of the heart, is peculiarly dull; and when effusion has taken place, some degree of fluctuation may be felt by the patient. In most instances, œdema of the lower extremities occurs, and occasionally a puffy swelling appears suddenly in the face, particularly under the eyes, and after a day or two disappears again.

When the sound on percussion over the cardial region is dull, and the extremities and face become puffy, we may conclude that considerable effusion of serum has taken place in the pericardium; and in this case the danger is always very great. Death from this affection often occurs very suddenly and unexpectedly; but in some instances a slow wasting of the body, and declension of the vital powers, under symptoms of general febrile irritation, gradually lead to a fatal termination.

On dissection, the whole internal surface is, usually, found florid; but the pseudo-membranous exudation, so common and conspicuous in acute pericarditis, is but rarely met with in this form of the disease. When albumenoid concretions of this kind do occur in chronic pericarditis, they are always "thin, soft, friable, and entirely resembling a layer of very thick pus," (Laennec.) The substance of the heart presents a whitish colour, "as if it had been macerated, several days, in water;" and it is sometimes of a much softer consistence than natural, whilst in other instances it possesses its normal degree of firmness. Laennec does not agree with those who suppose that the loss of colour in the muscular substance of the heart, is the consequence of inflammation; but he does not advance any facts which can be deemed sufficient to repudiate this opinion.

Treatment. A direct and active antiphlogistic treatment, is of course the only mode of management upon which any reasonable hopes of success can be placed. In cases attended with symptoms of pulmonic inflammation, the treatment should, in every respect, coincide with that which would be adopted in either pneumonia or pleuritis. Where the pericardial inflammation has supervened suddenly, soon after the disappearance of external *rheumatic* inflammation, blood-letting cannot, in general, be carried to the extent which is proper in cases arising from other causes. Indeed, the ordinary antiphlogistic means usually employed in phlegmasial affections, will rarely subdue rheumatic pericarditis; and copious abstractions of blood, are not unfrequently productive of serious mischief. In cases of this kind, *calomel* and *opium*, given in full and frequent doses, in conjunction with moderate general and local depletion and proper revulsive applications, constitute the most valuable curative means we possess. Dr. Latham speaks in the most favourable terms of the employment of mercury in pericarditis. It is particularly

valuable in rheumatic pericarditis, although much advantage may often be obtained from its use in every variety of the disease. "From acute pericarditis," says Dr. Latham, "which has proceeded to the deposition of lymph, nothing, I believe, can effect a perfect recovery, except *mercury*, given so as to excite moderate salivation." From my own observations, I am entirely convinced that calomel given to the extent of producing a general mercurial impression, is a valuable remedy in this affection. Where the disease is dependent on rheumatism, it will, I think, always be best to give the calomel in union with opium. In a case of rheumatic pericarditis, which came under my care about six months ago, I prescribed one grain of opium with three grains of calomel, every four hours, with unequivocal benefit. About sixteen ounces of blood were abstracted with the lancet, and thirty leeches applied to the region of the heart, before the calomel and opium were resorted to.

Blistering on the back between the shoulders, whilst blood is abstracted by leeching or cupping from the anterior cardial region, is a very powerful auxiliary in reducing this affection. The saline hydrogogue purgatives, are probably better suited to procure advantage in this affection than the other articles of this class of remedies. From what I have myself witnessed in relation to this point, I am led to believe that cremor tartar, with or without a portion of jalap, is the best purgative we can give in this affection. When the disease is of a chronic character, and there is reason to presume that serum has been effused in the pericardial cavity, diuretics will be proper. The squill in union with calomel, may be employed for this purpose. In this form of the disease, a more permanent counter-irritation over the region of the heart, than can be well obtained by blisters, should be kept up. Pustulation with the tartar-emetic ointment, or a caustic issue, will in general answer this purpose well.

CHAPTER XIV.

OF THE PHLEGMASIÆ OF THE FIBROUS AND MUSCULAR STRUCTURES.

SECT. I.—*Acute Rheumatism.*

ACUTE rheumatism generally commences with the ordinary initial symptoms of febrile affections from cold or atmospheric vicissitudes. A sense of chilliness, alternating with flushes of

heat, with general lassitude, loss of appetite, and depression of spirits, are the usual symptoms which attend the development of the disease. In many instances, a general soreness and aching of the body accompany these symptoms. Sometimes the febrile reaction becomes completely established before the local rheumatic inflammation supervenes; in other instances, more or less pain is experienced in one or several joints, or in other fibrous structures, from the commencement of the attack; and occasionally, though rarely, the local affection occurs before any manifest general sympathetic irritation takes place. The parts affected with rheumatic inflammation are swollen, red, and extremely painful—the slightest pressure or motion causing the utmost degree of suffering. When perfectly at rest, the patient often experiences some abatement of the gnawing and tearing pain during the day; but at night intense exacerbations usually take place. Whether the fever precede or rise with the development of the local inflammation, it always acquires additional violence as soon as the local affection is fully established—the pulse becoming full, frequent, and vigorous; the skin hot and dry; the tongue coated with a white fur, changing to a brown colour, as the disease advances; the thirst very urgent; the bowels constipated, and the urine scanty, of a deep red colour, transparent, and without sediment. In very severe cases, headach, and, occasionally, slight delirium, attend during the exacerbations.

Bilious rheumatism.—Acute rheumatism is sometimes complicated with conspicuous derangement of the biliary organs. This is the *rheumatismus acutus gastricus* of Richter, and depends, according to Stoll, on gastric irritation from redundant and vitiated bile in the primæ viæ.* Like *bilious pleurisy*, it is the result of the united operation of cold and koino-miasmata on the system. This variety of the disease is met with in miasmatic districts during the cold and variable months of the year, more especially after a warm and sickly autumn. The disease is usually attended with considerable pain in the head; a yellowish or icterode hue of the eyes; a thick layer of brown fur on the tongue; occasional nausea and bilious vomiting. The quantity of bile thrown up is sometimes very great; and after each spell of vomiting, an immediate and often almost complete, though but temporary, abatement of the local rheumatic pains usually occurs.

Gonorrhœal rheumatism.—Rheumatic pain and swelling of the knees and ankles, is no uncommon consequence of gonorrhœal irritation. In some instances, though rarely, the rheumatic affection becomes more general, very painful, and attended

* Ratio Medend. tom. ii. p. 25.

with very considerable febrile irritation. Cases of this kind have generally been ascribed to a suppression of the gonorrhœal discharge. This is the opinion of Brodie, and of Swediaur; but Mr. Bacot thinks this explanation of its origin "is to be understood in a very qualified sense." It appears, however, to be pretty well ascertained, that "neither the affection of the joints nor the more general rheumatism, come on until the gonorrhœa is on the decline." Young persons, of "strumous habits, florid complexions, and not particularly robust," are most liable to this form of rheumatic affection. This form of the disease is characterized by much puffiness and tenderness of the ankles, especially towards evening; the pain is not much increased by pressure—the stomach becomes deranged, and the appetite usually fails altogether. Now and then, "all the symptoms are suddenly relieved by an eruption of papulæ in clusters; or sometimes by pustules in minute patches." This eruption may continue from a few days to several weeks. When it appears, both the pains and constitutional symptoms go off entirely.*

The *rheumatismus non febrilis recens* of the German writers, though diverse from the *chronic* form of the disease, is not attended with very obvious symptoms of febrile reaction. It shows itself by more or less severe and sharp pain in some one of the muscular or aponeurotic parts of the body, particularly in the muscles of the breast, neck, and about the scapular region, and occasionally in the face and jaws. Sometimes the affected part is swollen and red; at others, neither swelling nor redness occurs. This variety of rheumatic inflammation generally arises from the local application of cold, such as currents of air directed upon some particular part of the body.†

Prognosis.—Although extremely painful, rheumatism is not a dangerous affection, so long as the inflammation remains in the external parts. When translated to some internal organ or structure—particularly to the heart, meninges of the brain, stomach, or lungs, the most serious consequences are to be apprehended.

The duration of an attack of acute rheumatism is extremely various, and depends much on the degree of constitutional predisposition to the disease; and on the remediate management adopted for its removal. When the disease is about terminating, general diaphoresis, with a copious pale-red sediment in the urine occurs; and, in some instances, moderate diarrhœa accompanies the declension of the fever and inflammation. It never terminates in resolution without the concomitant occurrence of diaphoresis and a lateritious sediment in the urine. It would

* A Treatise on Syphilis, &c. by John Bacot, Esq. Surgeon, &c.
† Richter, Specielle Therapie, vol. ii. p. 36.

appear from some observations of Dr. Chambers and Mr. Wigan, that the sweat in acute rheumatism is almost invariably of an acid quality.* I noticed this fact in a case I attended a few months ago. The patient wore a blue check shirt, the blue stripes of which were changed to a pale-red colour during the resolution of the disease.

Rheumatism occurs but very rarely during early infancy. Scudamore asserts, that infants are entirely exempt from it; but in this he is certainly wrong. I have met with several instances of acute articular inflammation, attended with the usual phenomena of rheumatism, in children under two years old. Very aged persons also, are seldom affected with the *acute* form of rheumatism, although especially liable to the *chronic* variety of the disease. From the seventh to the forty-fifth year of age, is the period during which acute rheumatism is most apt to occur. Lean and muscular persons of a sanguineous temperament are, in general, much more liable to this affection than individuals of a fat and soft habit of body, or of a nervous or lymphatic temperament. Among the most common and powerful accidental predisposing causes of rheumatism are, derangement and irritation of the alimentary canal; the inordinate use of spirituous liquors; fatiguing exercise, accompanied with protracted and copious perspiration; and the habitual use of high-seasoned and heating articles of food; and the abuse of mercury.

Cause.—Suppressed perspiration from cold or sudden atmospheric vicissitudes is incomparably the most frequent exciting cause of rheumatism. It is on this account that the disease is so much more common during the damp, raw, and variable months of spring and autumn, than in the more mild and equable season of summer. Indeed, rheumatism is almost peculiarly a disease of cold and variable climates—its occurrence in the warm and more *uniform* latitudes being comparatively rare. Mercury is generally accused as a very frequent cause of rheumatism. It is doubtful, however, if it is ever, of itself, the exciting cause of this affection, although its very especial tendency to *predispose* the system to the morbific influence of low and variable temperature is unquestionable; and it is, probably, by this effect alone, that the use of mercury is so apt to be followed by rheumatic affections. I have already adverted to gonorrhœal irritation as an occasional cause of rheumatic affections. It would appear that the occurrence of the arthritic pains is in some way or other connected with the disappearance of the gonorrhœal discharge; but whether the cessation of the discharge is to be regarded as the effect or the cause of the rheumatic affection, is as yet a matter of conjecture.

* Medico-Chirurg. Rev. April, 1828, p. 176.

In relation to the proximate cause of rheumatism, authors have expressed a variety of opinions. Formerly it was customary to regard the disease as depending directly on a peculiar morbific or *rheumatic* matter in the blood, which, being thrown or concentrated upon some particular part, was thought to be the immediate exciting cause of the local inflammation. Balfour advanced the opinion of its consisting in a peculiar inflammation of the cellular tissue; and Cullen supposed that an inflammatory state of the blood, in connexion with a peculiar phlogistic condition of the muscular structure, constitutes the proximate cause of the disease. With Broussais, it, of course, is the consequence of the all-embracing *gastro-enterite*. The opinion of Richter, that rheumatic inflammation is the consequence of irritation from *retained perspirable matter* (*materia perspirabilis retenta*,)* though savouring too much of humoral pathology for the prevailing taste of pathologists, is at least as plausible as any other doctrine that has been advanced on this subject, and by no means at variance with the immediate effects of its acknowledged almost invariable exciting cause.

Whatever ideas may be entertained in relation to the proximate cause of rheumatic inflammation, it is now generally admitted that the seat of this inflammation is in the *fibrous textures*—more especially in the aponeurotic and tendinous structures of the body. It is manifest, moreover, that this inflammation differs very materially from the other varieties of inflammation; and the opinion of Scudamore, that it is, *sui generis*, of a strictly specific character, is supported by its peculiar character and phenomena. The frequent and often rapid passage of the local affection from one part of the body to another, would seem to indicate something radically distinct, if not in the inflammatory action itself, at least in its immediate or proximate cause. This circumstance, too, favours the opinion that the disease consists in a peculiar diathesis, or general morbid condition of the system—the local inflammation being merely one of its effects, or external manifestations. We notice this migratory character in all inflammations which depend on some internal or constitutional affection. It occurs most conspicuously in gout, and in some varieties of erysipelas.

Metastasis of rheumatic inflammation to internal organs or structures, and consequent alarming and sometimes fatal consequences, is by no means unfrequent. It may pass upon the heart, diaphragm, stomach, bowels, intercostal muscles, and, in short, upon almost every sensible part of the body. When it is translated to the heart, the patient is seized with acute pain and a feeling of great anxiety in the cardiac region, with *palpitation*,

* Specielle Therapie. vol. ii. p. 18.

fits of partial syncope, and a pale, contracted, and distressed aspect of the countenance. Metastasis to the meninges of the brain, is attended with a sense of weight, and sometimes acute pain in the head, intolerance of light and sound, a wild and anxious expression of the countenance, occasional delirium, strabismus, and impaired vision.* When the stomach becomes the seat of the disease, violent cardialgia, nausea, vomiting, indigestion, "and symptoms imitating cancer or scirrhus of the pylorus" usually supervene. Cazenave says, that in some cases, nothing but a feeling of coldness or pain occurs in the epigastric region.† The same writer states, that he has known the bladder to be affected with rheumatism—producing retention of urine, and much pain in the vesicle region. Sometimes the lungs become the seat of the disease, in which case symptoms of peripneumony supervene. When it attacks the intercostal muscles, or the pleura, the phenomena of pleuritis occur. Cazenave states, that he has repeatedly known rheumatic inflammation to fix upon the uterus and its appendices, giving rise to severe pain in this organ. I have lately seen an instance of sudden translation of rheumatic inflammation from the wrist to the bowels, in a young lady, which was speedily followed by symptoms of subacute peritonitis. On the fourth day the pain and swelling reappeared in the arm, and the abdominal affection speedily subsided. Dr. Johnson observes, in relation to this disease, that though not often fatal *as external rheumatism*, yet in *its consequences*, he is led, from "long and attentive observation," to regard it as being productive of "a very considerable proportion of those active enlargements or hypertrophiæ of the heart, which we now so frequently meet in practice." Dr. Cox also refers to the "numerous cases of organic disease of the heart and pericardium, which he met with during his connexion with St. Guy's Hospital, that were referable to, or connected with rheumatitis."‡ His observations have led him to believe that "the majority of cases of organic disease of the heart in *young people*, are connected with rheumatism."

Diagnosis.—By the ancients, rheumatism and gout were generally described under the common name of *arthritis*, and it does not appear that they regarded these affections as being diverse from each other. The essential identity of these two diseases has, indeed, found advocates among modern pathologists, although the general sentiment, at present, is that they are radically distinct from each other. The principal distinguishing circumstances between these two affections are:—1.

* Observations on Acute Rheumatism and its Metastasis to the heart. By Thos. Cox, M. D. London, 1824.

† Memoir on the Treatment of Rheumatism. By Dr. Cazenave.

‡ Loc. citat. preface, viii.

The periodical recurrence of *gout* after it has once invaded the system; whereas, rheumatism does not possess this tendency, the patient often remaining entirely free from the disease during the rest of life, after having suffered an attack of it. 2. The distinct character of their causes; thus, rheumatism is conspicuously, and almost invariably, the result of atmospheric inclemency or vicissitudes causing sudden suppression of the cutaneous exhalation.* It is not produced, like gout, by indolence, in conjunction with the free use of vinous drinks, and rich, high seasoned, and stimulating articles of diet. An attack of acute rheumatism is not usually preceded by uneasy sensations in the stomach, and other gastric disturbances. Gout is very often preceded by dyspeptic symptoms. 3. The predisposition to gout is often transmitted from parent to offspring. This is rarely, if ever the case, in relation to acute rheumatism. 4. Gout is most apt to occur in debilitated and relaxed habits; its occurrence in lean, muscular, and temperate persons inured to hardships and toil, being extremely uncommon; whilst the reverse, in all these respects, obtains in rheumatism.

Treatment.—Although of a strongly marked phlogistic character, rheumatism is not so much under the control of direct depletion as most of the other phlegmasial affections. Blood-letting is undoubtedly a very important auxiliary in the treatment of this disease; but it is incapable, by itself, of subduing the local inflammation, however copiously practised. Indeed, the very profuse, sanguineous evacuations so frequently resorted to in this complaint, so far from proving beneficial, lead often to very disastrous consequences; for experience has fully established the fact, that metastasis of the local affection to an internal organ is particularly favoured by thus draining the system of its blood, and impairing the vital energies. "We have long been convinced," says Dr. Johnson, "from attentive observation, that the system of detracting large quantities of blood, in cases of acute rheumatism, is productive of more frequent metastasis from the extremities to internal organs than a more moderate treatment. If we do quell the external inflammation, a retrocession to some weakened organ is too apt to take place. Of this we have seen several instances."† The records of medicine furnish us with many examples illustrative of the correctness of this observation. The case reported by Dr. Kemper is a striking instance of this kind. This was a strongly marked case of inflammatory rheumatism; the fever was violent, and

* Richter says, rheumatism is always produced by *external* exciting causes, such as cold, and, therefore, more immediately from a *materia perspirabilis retenta*. Whereas, gout arises from internal causes, giving rise to a peculiar atony and weakness of the system.

† Medico-Chirurg. Review, June, 1823, p. 215.

"the joints of her limbs, from the elbows and knees downwards, were affected with swelling, redness, and most acute pain." In five days, nearly eleven pints of blood were abstracted from the patient. Metastasis of the disease soon took place, first to the lungs, and then to the head. At last the rheumatic inflammation returned to the extremities and relieved the internal organs.* Dr. Armstrong also, has related a case of this kind.† The inordinate use of the lancet, by debilitating the constitution, is, moreover, apt to prolong the disease in a subacute or chronic state, and to strengthen the predisposition to a recurrence of the affection. "In no way," says Scudamore, "is a degeneracy into chronic symptoms so certainly induced, as by that injudicious employment of general bleeding which enfeebles the constitution, and still leaves the rheumatic disposition in great force. Nor does the articular disease itself yield to the use of general bleeding in the manner which we might expect.‡

Blood-letting is, however, not to be entirely neglected in this affection. It is only against the too common abuse of this evacuation that these observations are directed. In strong, muscular, and plethoric subjects, general bleeding, until some impression is made on the pulse, is a useful preliminary to the employment of the more efficient remedies in this affection. In general, one or two pretty copious evacuations in the commencement of the disease, will be sufficient to procure all the advantages this measure can afford. The attempt to render the pulse soft and moderate in its action by blood-letting in this disease, will almost always fail, unless blood be drawn to a very dangerous extent. The usual indication furnished by the buffy coat of the blood, for further depletion in inflammatory affections, is wholly fallacious in rheumatism; for the buffy coat will generally continue in despite of the most copious and repeated abstractions of blood. "A surer practical indication may be taken from the form of the coagulum and its firmness. When it is exceedingly cupped, and when the inferior part beneath the stratum of fibrine is very firm, it is a presumptive evidence that the heart and arteries are labouring under that morbid contractility which distinguishes the inflammatory diathesis."§

When the disease fixes itself *early* on some internal organ—particularly the heart, diaphragm, or brain, it will be necessary to resort to prompt and decisive bleeding; but even in cases of this kind, it will be much better after one or two copious abstractions of blood, to resort to the use of opium and calomel, than to a repetition of the bleeding.

* Philadelphia Jour. Med. and Phys. Sciences, No. 12.
† Lond. Med. and Phys. Jour. No. 289.
‡ A Treatise on the Nature and Cure of Rheumatism. London, 1827, p. 70.
§ Scudamore, loc. citat. p. 70.

Purgatives are always useful in this affection. I have often known the inflammatory condition of the system more effectually reduced by the operation of two or three saline purgatives, than could be effected by several copious abstractions of blood. The more drastic articles of this kind ought to be avoided. These are in some degree incompatible with that regular action of the cutaneous exhalents which seems to be indispensable to the removal of this affection. Laxatives, on the contrary, are of much service by removing the sources of intestinal irritation—equalizing the circulation and moderating the febrile reaction, without causing injurious irritation by their direct impressions on the mucous membrane of the bowels. As a general rule, the saline purgatives are to be preferred. I have usually directed from six to eight grains of calomel at night, to be followed next morning by a small dose of Epsom or Glauber salts. Scudamore speaks very favourably of an aperient draught composed of small doses of carbonate of magnesia, carbonate of potash, sulphate of magnesia, with tartarized antimony, acetum colchici, and lemon juice sufficient to neutralize the carbonate of potash, and a portion of water and syrup. Two ounces of Epsom salts, with a grain of tartar emetic, dissolved in eight ounces of water, and taken in doses of a table-spoonful every hour, is an excellent aperient in this complaint.

Emetics have been much recommended in the treatment of rheumatism, and my own experience has furnished me with some striking examples of their usefulness. Horn asserts that he has derived more prompt advantage from emetics in this complaint, than from any other remedy.* I attended a gentleman, a few years ago, who was suffering extremely from an attack of acute rheumatism. The principal pain and swelling was in all the joints of the left arm, and in the right knee. He had been freely bled and purged before I saw him, but the pains continued unabated. With a view to excite diaphoresis, and to moderate the febrile reaction, I prescribed a solution of tart. antim. Contrary to my intentions, the first dose produced pretty free vomiting. Almost immediately his pains were greatly mitigated, and continued so for three or four hours, and then gradually returned, though not to their former state of violence. On the following morning, I gave him an antimonial emetic, which produced full emesis, and again the rheumatic pains subsided, almost entirely, for a few hours; they returned, however, as before, but so greatly diminished, that he was enabled to obtain considerable sleep during the following afternoon and night. On the third day, he took another emetic,

* Uber d. heils. wirk. d. brechmittel in hitzigen rheumat. Archiv. b. viii. s. 2.

after which the disease disappeared rapidly and completely, under the use of a few full doses of opium. I have, since that time, derived signal advantage from emetics in several cases of this affection.

When rheumatism is complicated with functional disorder of the *liver*, emetics are particularly useful. In instances of this kind, the local pain will often almost entirely disappear for a time; and if full doses of calomel and opium are administered soon after the vomiting has ceased, convalescence will sometimes speedily ensue.

Diaphoretics may be employed with advantage, although little or no benefit is usually derived from *profuse* sweating excited by remedies of this kind. A gentle and uniform diaphoresis is always serviceable. For this purpose, small doses of *tart. antim.* in union with calomel and opium;* or with camphor and nitrate of potash;† or Dover's powder with calomel, may be advantageously employed. Scudamore recommends the following diaphoretic and anodyne mixture as particularly beneficial in this respect:

℞ Potassæ carbonat. gr. cviii.
Succi citric. (recentis) ℥ii.
Misturæ camph. ℥iiiss.
Liquoris opii sedativ. ℥iss. ad ℥il.
Syrup. tolutan. ℥ss.
Antim. tartarisat. gr. i. ad gr. ii.

M. Of this mixture, one, two, or three table-spoonfuls are to be taken every hour or two, until the pain is relieved.

The diaphoretic tendency of these remedies should be promoted by the use of warm diluents; such as a weak infusion of eupatorium perfoliatum, of elder blossoms, &c.

Opium, under judicious management, is a valuable remedy in acute rheumatism. When employed in *full* doses, after proper venesection and purging, in combination with calomel, or with ipecacuanha, or tart. antim. it seldom fails to procure speedy relief, and to hasten the resolution of the local and general inflammatory action. When, after copious depletion, or from constitutional feebleness, the rheumatic inflammation passes upon some internal organ, opium is almost the only remedy upon which any reasonable hope of advantage can be

* ℞. Tart. antimon. gr. i.
Pulv. gum. opii. gr. iii.
Calomel gr. iv.
Pulv. sacch. albi gr. xii.
M. Divide into eight equal parts. S. Take one every two hours.

† ℞. Tart. antimon. gr. i.
P. g. camph. gr. viii.
Calomel gr. iv.
M. Divide into eight equal parts. S. Take one every two or three hours.

placed. In my own practice, I have had many striking examples of the usefulness of this narcotic in the present affection. It should be given in full doses, and repeated every three or four hours, until relief from the pains is procured. Small doses of opium have a tendency to increase the phlogistic diathesis, whilst large ones, properly repeated, generally produce a contrary effect in acute symptomatic fevers. "It is worthy of consideration," says Scudamore, "that so powerfully does pain modify the influence of opium on the nervous system in every kind of disease, that it may be given in the boldest doses without hazard or ill effect, when pain is intense; and *in no way except by the active repetition* of such doses can it be really efficacious when the occasions for it are urgent." Dr. Cazenave very justly observes, that the timidity with which this narcotic is usually administered in acute rheumatism, is the cause of its frequent failure in doing conspicuous good. His mode of using the opium, in this affection, is to give a grain of it every hour, "till a complete calm is established, or an abundant perspiration induced."

Most practitioners who are in the habit of employing opium in rheumatism, use it in combination with calomel; and this has appeared to me the best mode of using it. After venesection, and the free operation of a cathartic, I generally resort at once to opium and calomel, in the proportion of one grain of the former to two of the latter every three or four hours, until the gums are slightly affected; after which I continue with half a grain of the opium, at first every three hours, and gradually prolonging the intervals in proportion as the disease subsides. I have frequently found, that as soon as the mercurial action was established, the skin became moist and relaxed, the pulse soft and less frequent, the urine sedimentous, with a rapid declension of the local and general affections. Dr. Armstrong observes, that after prompt venesection, followed up by purgatives with calomel and opium, recovery is often surprisingly rapid. Many highly respectable authorities might be cited in favour of the united employment of these two articles in rheumatism.* "This treatment of acute, and we may say chronic rheumatism," ob-

* Dr. Chambers, of St. George's Hospital, London, gives ten grains of calomel, with two of opium, every night, or night and morning, with a daily dose of black draught to evacuate the bowels. He states, that as soon as the mouth becomes affected, the symptoms usually subside. He does not push the medicine to the extent of producing ptyalism.—*Med. Chir. Rev.* vol. v. p. 566.

Mr. Gosse, of Geneva, has employed calomel and opium to ptyalism with success, in acute rheumatism. From some chemical experiments which he made with the blood of persons under salivation, he found that it contained much less albumen, as well as cruor, and was more liquid than usual; and that it is therefore less inflammatory. Similar opinions have been expressed by Dr. Farr and Mr. Travers.—(*Med. Chir. Rev.* vol. i. p. 482.)

serves Dr. Johnson, "is employed by many practitioners, and it is that which we have had recourse to for twenty years past."* It is not necessary to continue the calomel to the extent of producing free ptyalism. The slightest evidence of the mercurial action in the gums, is in general sufficient.

The cinchona was formerly much recommended in the treatment of this affection. When, after depletion and purging, distinct remissions of the febrile symptoms occur, particularly in weak and relaxed habits, the powdered bark or quinine may be employed with advantage. But in robust, muscular, and sanguineous habits, it is much more apt to do harm under any mode of management, than benefit. I have known very manifest injury done by the bark in this affection. During convalescence it is a proper and useful remedy.

Colchicum was at first prescribed only in the subacute or chronic forms of rheumatism; but later experience has shown that it may be employed with equal benefit in the acute form of the disease. Mr. Hayden, in his work on the remedial powers of this root, asserts, that it possesses very considerable powers in controlling the action of the heart, and subduing inflammatory excitement. I have exhibited this article in seven or eight cases of acute rheumatism. In one instance it removed the disease completely in the course of three days, although previously very violent, and after calomel and opium, tart. antimon., venesection, and free purgation, had been ineffectually used. In a few instances it appeared to do some good, but in others no advantage whatever resulted from its use. Recently, however, I prescribed it in two instances of a subacute character with the happiest effect. Both patients were relieved by it in forty-eight hours, although the disease had for several weeks resisted other modes of treatment. Scudamore recommends the following formula for administering this remedy, where the inflammatory diathesis is not strong:

℞.	Liquor. ammon. acetat.	℥ss.
	Vini colchici	gtt. xx. ad xxx.
	Syrupi papaveris	℥i.
	Misturæ camph.	℥i.

M. This draught is to be taken every sixth or eighth hour.

The vinous tincture of the colchicum seed may be given to the extent of from 20 to 30 drops, with about a scruple of calcined magnesia every four hours, until slight nausea or purging is produced.

When acute rheumatism continues until it assumes a subacute character—the pulse remaining irritated, small, sharp, and frequent, and the countenance pale, while the affected joints are

* Med. Chir. Rev. October, 1826, p. 566.

swollen, painful, and œdematous—great benefit may sometimes be derived from the extract of stramonium, given in quarter grain doses every four hours until vertigo ensues. I have succeeded in removing the disease, in a short time, in several instances of this kind, by means of the stramonium, after various other modes of treatment had been employed without avail.

Very little advantage is in general to be obtained from *local treatment* during the active period of the disease. After the general inflammatory excitement has in a great degree subsided, benefit may be derived from leeching the affected parts. I have also known much good done by blistering the inflamed joints under such circumstances.

The treatment by *compression*, so strongly recommended by Balfour, has not met with much approbation; less I think than it deserves. I have in a few cases of subacute rheumatic inflammation, known very considerable relief obtained from a flannel roller applied pretty firmly round the affected joint.*

The diet should, of course, consist of the mildest liquid farinaceous articles of food. The drink may be cool and acidulated, except when diaphoretics are administered, when tepid diluents should be used. The temperature of the sick chamber should be kept comfortable and uniform.

Sect. II.—*Chronic Rheumatism.*

The symptoms of chronic rheumatism are much less uniform and definite than those which characterize the acute form of the disease. Chronic is often the consequence of acute rheumatism; but it occurs also, frequently, as a direct consequence of exposure to cold and damp air, more especially when the system is under the influence of mercury. The affected parts are commonly neither swollen nor red; nor is there often any manifest fever connected with the chronic variety of the disease; although quickness, tension, and contraction of the pulse are in some instances present in the evening, and during the night. The pain often wanders from one part to another, fixing itself, by turns, in the head, shoulders, knees, wrists, fingers, hips, loins, &c.—more especially in those cases which approach the subacute character. Some individuals are hardly ever entirely free from pain; others are affected with it only occasionally, on the occurrence of damp and cold weather. In some instances, the pain is seated in the joints; in others, in the muscles and parts situated between the joints. After remaining at rest for awhile, the

* Observations on the Pathology and Cure of Rheumatism. By William Balfour, M. D.—*Edinburgh Med. and Surg. Journal*, April, 1825.

patient feels stiffness and pain on attempting to move the affected limb; but on using exercise, until the body becomes warm, both the pain and stiffness are apt to disappear. Those who are subject to this form of the disease, generally feel a dull aching pain in one or more joints, on the approach of stormy and rainy weather. Severe and inveterate cases of chronic rheumatism are apt to give rise to organic disease of the tendons, bursæ mucosæ, with wasting and hardening of the muscular structure about the affected parts. The ligaments also, sometimes become rigid, thickened, and the joints stiff. A jelly-like effusion into the cavity of the affected joints occurs occasionally. (Scudamore.)

When the disease affects the muscles of the loins, it is called lumbago. Lumbago is distinguished from nephritis by the absence of pain along the ureters, of retraction of the testicles, of the frequent desire to avoid urine, and of the nausea and vomiting which characterize the renal disease. In lumbago too, great difficulty and pain is experienced in bending the body forwards on the hips. In nephritis no uneasiness is caused by this movement. When the periosteum of the anterior aspect of the tibiæ, or of the ulna, or os frontis, becomes thickened and tender to the touch, we may presume that the chronic rheumatic affection is syphilitic, or mercurial.

Chronic rheumatism sometimes occurs as the sequel of the acute form of the disease; and it arises frequently, also, as a direct consequence of suppressed perspiration from cold, damp, and variable weather. It is generally supposed that the action of mercury is particularly apt to give rise to chronic rheumatic pains; but it is extremely doubtful whether it possesses any direct tendency in this way. That the system, when under the mercurial influence, is extremely susceptible of the injurious effects of cold and humid air, is indeed sufficiently ascertained; and it is probable that when rheumatism follows the constitutional operation of mercury, it is always the immediate consequence of subsequent influence of cold. Syphilis is apt to give rise to distressing chronic pains of a rheumatic character, but even where syphilis appears to be its cause, it is probably often the consequence of improper exposure while the system is under the mercurial influence.

Mr. Teale has recently published a small work on subinflammation and irritation of the spinal marrow, in which he asserts that not only neuralgic but rheumatic affections frequently depend on irritation, or a slight degree of inflammation, at the origin of the spinal nerves. His observations on this subject appear to me highly important, and from an instance which has quite lately come under my notice, I am satisfied that in some cases at least, chronic pains of a rheumatic character depend on spinal

irritation. Dr. J. K. Mitchell, of this city, has, within a short time, published an interesting paper on this subject, in which he has detailed several striking instances of the speedy removal of severe pains of this kind, by cupping over the spinal region. It would appear from the observations of Teale and Mitchell, that in many cases of fixed pains, simulating rheumatism, one or more of the vertebræ of the spine are very tender to pressure, and that, if in such cases, leeches or cups be applied over the diseased portion of the spinal marrow, almost immediate removal of the rheumatic pains will be effected. In the case which occurred in my own practice, the patient had complained of constant severe pain in the left foot for several months, and the usual means for the cure of such affection, procured only slight temporary benefit. Instructed by the cases reported by Dr. Mitchell, I at last examined the track of the spine, and found two of the lower lumbar vertebræ morbidly sensible to pressure. I directed thirty leeches to the part, which afforded great relief, and in a few days afterwards more blood was drawn from the same spot by cupping, and this had the effect of entirely removing the disease in the foot. When the pains are situated in the head and upper extremities, the spinal affection, if any exist, will be found in the cervical vertebræ; and when a part about the chest, and upper portion of the abdomen, is the seat of the painful affection, there will probably be spinal irritation in one or more of the dorsal vertebræ. Under the head of neuralgia, I shall again have occasion to speak of this subject; and, in fact, the painful affections which result from this cause, are probably always strictly of a neuralgic character, although often mistaken for chronic rheumatic inflammation. I must again repeat, that the facts developed by Mr. Teale, are highly interesting, and will, no doubt, receive due attention from the profession.

Treatment.—Unless the patient be robust, vigorous, and plethoric, general blood-letting is not only useless, but often injurious, in the strictly chronic form of the disease. Attention should be paid to the state of the digestive functions, and to the bowels. Where the appetite is weak and variable, and the bowels inactive, five or six grains of blue mass should occasionally be taken at night, followed in the morning with some gentle aperient—such as the aromatic tincture of rhubarb; or a small dose of the compound infusion of senna. Where there is a general sluggishness or languor of the system, the cinchona bark, or quinine, will sometimes prove decidedly beneficial. Certain diaphoretics of the stimulating kind have been much employed in the treatment of this variety of rheumatism; and of these, *gum guaiacum* has held by far the highest rank. In individuals of a relaxed and phlegmatic habit of body, and in old persons of a worn-out constitution, it may be used occasion-

ally with much advantage; but in persons of a contrary habit—plethoric, athletic, and phlogistic—it will seldom do good, and is even apt to do harm by its heating and irritating qualities. The usual mode of giving it in the form of a tincture, renders it still more objectionable in habits of this kind. In all instances, perhaps, it is best to give it in the form of an aqueous mixture, thus:

℞. Pulv. g. guaiaci ʒi.
—— g. arabic ʒiii.

Triturate them together in a mortar, and add gradually ten ounces of cinnamon water. Of this, three or four table-spoonfuls may be taken daily.

In cases partaking of a subacute character, or in such as result from the influence of cold while the system is under the operation of mercury, *tart. antimon.* will occasionally prove beneficial. In instances of this kind, I have used this article dissolved in a decoction of the root of burdock, (*arctium lappa*) with excellent effects. A grain of the tart. antim. should be dissolved in a pint of the decoction (an ounce of the root to a pint of water) and drank in the course of the day. In such cases, however, more advantage may in general be derived from the judicious employment of *mercury*. In syphilitic and mercurial rheumatism, the production of a gentle mercurial impression on the system, with the concomitant employment of the compound decoction of sarsaparilla, will often effectually eradicate the disease. But even in cases which are not connected either with a syphilitic taint or with mercurial disease, this remedy will sometimes prove decidedly beneficial. In inveterate and obstinate cases of chronic rheumatism, says Scudamore, "a well-conducted mercurial course, so as to produce and keep up a very moderate ptyalism, will sometimes prove successful after the failure of all other means." Advantage may be obtained from the use of the vapour-bath as an auxiliary to the mercurial course. I have used the following decoction, conjointly with mercury, with peculiar advantage:

℞. Rad. sarsaparil. ʒiii.
Fol. cymapylla umbelat. ʒiss.
Rad. mezerion ʒiii.
Cort. ulmi fulv. ʒiss.
Aqu. fervent. ℔iii.

To be boiled down to three half-pints; of which a wine-glassful is to be taken four times daily.

In the same variety of chronic rheumatic pains, I have also administered the *sulphate of zinc*, in one grain doses three times daily, with the happiest effects. In one instance, after mercury, sarsaparilla, and a variety of other remedies had been fully tried without success, the zinc gave complete relief.

The extract of *stramonium* is highly recommended as a remedy in this affection by Dr. Marcet; and it is unquestionably

an article of very valuable powers, in chronic painful affections, unconnected with a phlogistic state of the system. Twenty years ago I employed the tincture of the stramonium seed in chronic rheumatism; and I have frequently found it promptly and completely successful, although often also entirely disappointed in its use. In some parts of the United States it has long been used as a domestic remedy in this affection; and it was from having seen it successfully employed by an old female in a case which had foiled all my efforts, that I first learned its remediate powers in this disease. I usually give 20 drops of the saturated tincture of the seed three times daily; and direct it to be continued until vertigo, or symptoms of gastric disturbance ensue. I have also employed the extract of stramonium in union with lactucarium, as is recommended by Scudamore, with excellent effect. "In some recent attacks," says this writer, "in which wandering nervous pains have been mixed with lumbago, the effects of this combination have been surprisingly successful. In a few cases, even of long standing, I have derived much satisfaction from this remedy."

Colchicum is a remedy of considerable powers in chronic rheumatic affections. I have found it most useful, however, in subacute cases, and in such as are the consequence of the acute form of the disease. In instances of a strictly chronic character, I have never derived any obvious advantage from this article; in such cases, it is, I think, inferior in efficacy to the stramonium.

In mercurial and syphilitic pains, *arsenic* will often manifest very excellent powers. It may even be given with occasional advantage in old and obstinate cases arising from other causes—and it is said to be particularly beneficial in such as depend on the repulsion of some chronic cutaneous affection. In several instances of a mercurial origin, I have prescribed Fowler's solution with complete success.

After what has already been said above, I need scarcely dwell on the propriety of examining the spinal column, in chronic pains of a rheumatic character. When any portion of it is found unusually tender to pressure, leeches, cups, or a blister, should immediately be applied over the tender part. If the disease be the consequence of spinal irritation, it will frequently speedily disappear under the use of these local remedies.

A great variety of other internal remedies have been recommended for the cure of this form of rheumatism. Of these, *savin*, *nux vomica*, *phytolacca decandra*, *dulcamara*, hyoscyamus, sulphur, turpentine, and *xanthoxylum fraxineum* are the most important. The savin is an old remedy in chronic articular pains;* I knew an empiric, about twenty years ago, who

* Rave, Beobachtungen, &c.—Munster, 1796.

was noted for his success in curing chronic rheumatism. His remedy was an electuary composed of savin, sulphur, and honey. I have prescribed it in a few instances with benefit; but in several cases its effects were manifestly injurious.

In chronic rheumatic pains of the hips (*sciatica*) and muscles of the loins (*lumbago*) the *spirits of turpentine* is among our most efficacious remedies. Home states, that he cured five out of seven cases of sciatica with this article.* Within the present year I succeeded completely in removing a violent and protracted case of this affection by the turpentine, given in doses of twenty drops with a scruple of *lac sulphuris* three times daily. I have known the infusion of *capsicum* employed with marked advantage in a case of inveterate chronic rheumatism; and the juice of the *poke-berries* (phytolacca) is a familiar remedy in this affection, and has occasionally done considerable good. While practising in Lancaster county, I saw several instances of the successful use of a decoction of *xanthoxylum* in chronic rheumatism. Professor Wendt has found an infusion of the *clematis recta* and *vitaba* a very useful remedy in this disease.

Various *external* applications have been resorted to with advantage in this affection. The application of the *tourniquet*, so as to cause a temporary interruption in the circulation of the affected part, is said to have done much good.† Lately, the *vapour* of *camphor* has been used with success in chronic rheumatism by M. Delormel and M. Dupasquier.‡ The whole surface of the body, with the exception of the head, is to be exposed to the fumes of camphor, in an apparatus similar to the one used for the sulphurous vapour-bath. The camphor is evaporated by throwing it upon a dish of hot coals.

Acupuncturation has, of late years, been practised by many physicians in local rheumatic pains unconnected with fever; and the numerous accounts that have been published respecting its effects, are sufficiently favourable to entitle it to considerable attention. Mr. Berlioz observes, that "vague and wandering rheumatism sometimes attacks the external muscles subservient to respiration; the patient is obliged to remain motionless; every motion of the trunk compels him to cry out; deep inspiration is very difficult; and cough occasions such intense pains that expectoration is impossible. Acupuncturation dissipates instantly this state of distress, and renders the muscles their full liberty of action. In the space of one or two minutes, a patient whose sufferings drew from him tears, becomes entirely relieved." This operation has been found particularly efficacious in *lumba-*

* Clinical Observations and Experiments.

† Richter's Specielle Therapie, b. ii. s. 61.—Abhandl. fur Pract. Arzte, b. xx. p. 509.—See also Duncan's Annals for 1801.

‡ Rev. Medicale, Mai, 1829, p. 298.

go; and instances of its successful employment in *sciatica* have been reported. Acupuncturation should, however, never be practised in cases attended with general febrile irritation; or, in inflammations approaching the acute character.

Rubefacients are always useful in cases of a strictly local character. Camphor dissolved in æther, as recommended by Ferriar, is an excellent application for this purpose. I have generally preferred using the following liniment:

℞. Spir. camphor.
Aquæ ammon. āā ℥iss.
Ol. olivar. ℥i.
Spir. vini. rect. ℥iv.
M.

The warm bath, in conjunction with mercurial or diaphoretic remedies, has been useful in this affection. Baths and *douches* of artificial sulphurous waters have been particularly recommended. In local rheumatic affections, advantage may sometimes be obtained from blistering or cupping the affected part; but the benefits derived from means of this kind are seldom more than temporary. Sweating, induced by muscular action, particularly by walking, with an additional quantity of clothing, rarely fails to give temporary relief, and has been known to remove the disease altogether by frequent and regular repetition of the exercise.*

Sect. III.—*Gout.*

Gout is a constitutional affection, depending on a *peculiar* diathesis, and manifesting itself in its regular form by external local inflammation of the fibrous structures and fever of the synochal grade. In relation to its symptoms and progress, however, it is subject to certain prominent modifications, which have given rise to its division into the three following varieties: *acute*, *chronic*, and *retrocedent* gout.

1. *Regular gout.*—The acute or regular form of the disease occurs in *paroxysms* at longer or shorter intervals, leaving the patient in an apparently perfectly healthy condition during the intermediate periods. Occasionally the paroxysm comes on suddenly, without any warning of its approach; but, in by far the greater number of instances, it is preceded by various premonitory symptoms: such as disturbed digestive function; a peculiar, uneasy, anxious, and empty feeling in the pit of the stomach; a sense of tension and weight in the abdomen; an irritable state of the bladder; flatulency and acid eructations; costive-

* Marcet, Lond. Medico-Chirurg. Transactions, 1812.

ness ; a white tongue ; giddiness ; great lassitude ; yawning, and stretching the limbs ; cramps of the muscles of the legs ; drowsiness, with disturbed sleep, depressed spirits, and debility. In some instances, a disagreeable itching of the skin occurs a few days previous to the attack ; and in most cases, the urine acquires a deep-red colour. Some persons experience a feeling of numbness and formication in the lower extremities, with coldness of the feet and legs, before the paroxysm comes on. Sometimes the appetite is depraved and voracious, attended with occasional nausea and vomiting. Not unfrequently *blennorhœal* discharges occur from the bowels or bladder, or a copious secretion of mucus takes place in the bronchia. Some patients experience a sensation as if warm, or more commonly cool air were passing in a gentle stream, up and down the extremity, which is about becoming the seat of the disease. According to Van Swieten, the venereal propensity is sometimes particularly urgent just before the accession of the attack.* Of all these symptoms, the dyspeptic, or those indicative of gastric disturbance, are the most common precursors of the gouty attack. The duration of this premonitory period is very indefinite, and varies from a few hours to many days.

The attack generally comes on at night. About two or three o'clock in the morning, the patient is roused from sleep by a severe pain in the ball of the great toe, or in the heel, or instep of one foot. Chills or rigors speedily ensue, terminating, after a short period, in febrile reaction. The pain now becomes more and more severe ; the patient is restless, his skin hot and dry, and the pulse frequent, full, and generally hard. About five o'clock in the morning, some remission in the general and local symptoms usually occurs, with more or less profuse perspiration, and a short interval of imperfect rest is obtained. In some instances, the pain and fever continue with unabated violence, until about the middle of the following night, when they gradually decline, under a moderate flow of sweat—the patient sinking into a quiet sleep towards morning. In very severe attacks, however, no obvious remission of the symptoms takes place, until the third or fourth morning. In all instances, however, the sufferings of the patient are greater during the fore-part of the night than in the day. When the affected part is examined in the morning after the accession of the paroxysm, it is found swollen, red, and the veins of the foot greatly distended with blood. The swelling is of an œdematous character, more especially after the disease has continued a few days. The tenderness of the inflamed joint is so great, that the weight of the lightest bedclothes is often insufferable, and every motion or agitation

* Comment. vol. xiii. p. 44.

of the limb excites the most torturing pains. In slight attacks, the constitutional symptoms are moderate ; but, in the severer cases, the febrile excitement is always very considerable. The digestive functions are almost invariably conspicuously deranged ; the tongue is furred, the appetite wholly depressed, the thirst urgent, the bowels constipated, with colic pains, and a sense of uneasy weight in the epigastrium. An unusual degree of nervous irritability prevails during the paroxysm, the patient being generally fretful, irritable, and difficult to please.

The duration of a first paroxysm of the disease is seldom less than five, or more than nine days; but in subsequent attacks, it is often protracted beyond the second, or to the end of the third week. After the disease has subsided in one foot, it occasionally attacks the other, and passes regularly through its course, as in the first instance.

The patient is usually left in a much better state of health, after the complete subsidence of the paroxysm, than he enjoyed previously to the occurrence of the attack. His mind and body are, as it were, renovated; his appetite and digestion is good, and his powers, both mental and corporeal, more lively and energetic. Sooner or later, however, according to the degree of constitutional predisposition, and the habit of living, the paroxysm is renewed. At first, the return of the disease is generally at long intervals; in some cases, only after a period of three or four years; though more commonly, its first visits are annual. The intervals of its recurrence gradually become shorter, in proportion as the constitutional energies are enfeebled by its attacks, until at last, "the patient is hardly ever tolerably free from it, except perhaps for two or three months in the summer." (Cullen.) The periodicity of gout is occasionally very regular. Scudamore mentions an instance where the attack returned regularly on the 12th of April, for three years in succession. Such a strict periodical recurrence of the disease, is nevertheless very rare.

At first, the inflammation occurs generally only in the feet; but when by the frequent recurrence of the attacks, the system is weakened, and the gouty diathesis strengthened, several joints sometimes become simultaneously affected, or the inflammation passes successively from one external part to another, in the same paroxysm. (Scudamore.) "The external appearances of the disease," says Scudamore, "vary considerably, according to the situation and particular texture of the part which is affected. The redness of surface, together with the œdematous swellings, are most remarkable on the great toe, on the foot, the back of the hand, and at the elbow; while at the ankle, knee, and wrist, the increased bulk is produced chiefly by the distention of the

bursæ, and the sheaths of the tendons, and takes place often with little change in the natural colour of the skin."

The *sequelæ* of gout are various, and sometimes of a very distressing character. The liver always suffers more or less functional disorder, and in some instances, undergoes structural derangement. The stomach seldom escapes becoming permanently debilitated from repeated attacks of the disease. The local effects of repeated attacks of gout are sometimes less distressing than the general affections which result from it. The tendons about the affected parts become hard and knotty, and in some instances complete anchylosis ensues.

Chronic gout.—When, from the repeated attacks of the acute form of the disease the system becomes enfeebled, or where there is an original deficiency of constitutional energy connected with the gouty diathesis, the disease does not manifest itself by paroxysms of *acute* inflammation, but by chronic, wandering, and irregular pains, bearing much resemblance to chronic rheumatism.

The pain in chronic gout is usually but moderate during the day, the patient experiencing only a sense of alternate heat and coldness in the affected parts; at night, however, it is generally severe and aching. A feeling of numbness and weight is experienced in the diseased parts, and slight cramps are apt to occur during the fore-part of the night, and the sleep is restless, and interrupted by sudden startings. The affected joints retain their natural colour, or present only a slight purplish hue; but they become œdematous, tender, and more or less stiff; and the neighbouring muscles are weakened, and sometimes diminished in size. The inflammation often passes successfully from one joint to another, or it leaves its original seat, and fixes upon some distant joint, and after having remained there for awhile returns to the part it had left.

There is rarely any very conspicuous fever; but the digestive and biliary organs are generally very prominently deranged. The dyspepsia attending this form of the disease, says Scudamore, is particularly characterized by great oppression, and flatulent distention of the stomach after a full meal, together with heartburn, and occasionally a sense of coldness in the stomach. The bowels are usually torpid, or affected with mucous diarrhœa; the urine is turbid, and often charged with mucus; the skin dry, contracted, and sallow; the bilious secretion deficient; and both the animal and vital functions much impaired. The temper in this variety of the disease is always very irritable, dissatisfied, morose, irresolute, and sometimes gloomy or hypochondriacal. In some instances, pain is occasionally felt in the kidneys, or neck of the bladder, and gravelly matter is discharged with the urine.

The local consequences of inveterate or chronic gout are often extremely distressing. The ligaments become thickened; the bursæ mucosæ indurated and enlarged; and the tendons knotty, rigid, and contracted. In some individuals, strongly predisposed to the disease, earthy matter is deposited in the bursæ, sheaths of the tendons, under the cuticle, and in the cellular membrane surrounding the affected joint. Mr. Brodie observes: "the effects of gout on the joints are very remarkable. The cartilages are absorbed; the exposed surfaces of bone are entirely, or partially encrusted with white earthy matter, which I conclude to be urate of soda; and sometimes they have the appearance of being formed into grooves, as if they had been worn from their friction on each other."

Retrocedent gout.—When the gouty inflammation, either of the acute or chronic form, leaves its external seat, and fixes on some internal organ, it constitutes what is termed retrocedent gout. This *retrocession* of the disease may depend either on a want of constitutional energy; or upon an accidental or habitual weakness of some internal organ; or finally, on cold, repelling, and debilitating applications made to the external gouty inflammation. The disease may be translated to almost every internal organ; but the parts most commonly affected, are the stomach, bowels, brain, heart, and kidneys. When an acute attack of gout passes to the brain, coma, furious delirium, or symptoms of apoplexy, speedily ensue. Paulmier relates a case where the retrocession of gouty inflammation from the foot to the brain, gave rise to peculiar visual illusions; the patient being harassed by a confusion of horrid and ludicrous sights, which were removed in a few hours by epispastics applied to the feet.* When the stomach becomes its seat, violent and often fatal spasm of this organ, or symptoms of acute gastritis supervene. In the intestines, retrocedent gout generally gives rise to enteritis, or violent cholic. If the heart becomes its seat, symptoms of angina pectoris, or more commonly protracted and generally fatal syncope occurs. When the disease passes to the lungs, it gives rise to violent and most painful asthmatic symptoms; in the kidneys it causes nephritis; and when it fixes on the neck of the bladder, the phenomena of vesicle calculus ensue.

It has been a subject of considerable controversy whether the internal affection which arises from translated gout be of an inflammatory nature, or whether spasmodic. It is probable, I think, that the metastastic affection may assume either character, according to the structure upon which it falls, or the peculiar habit of the system. In the stomach, it appears sometimes under the form of violent and rapidly fatal spasm; and in the

* Dict. des Scienc. Med. t. xix. p. 112.

brain, coma and convulsions; although in both organs the ordinary symptoms of inflammation often occur when invaded by the disease.

In the *atonic* and obscure form of the disease, where the gouty affection is, as it were, floating about in the system, with an occasional imperfect manifestation of its presence in the joints of the extremities, the effects of its attacks on internal parts are not so violent and dangerous as those resulting from metastasis of the acute form of the disease, although often extremely distressing. Indeed, atonic, or irregular chronic gout, often fixes upon internal organs at once, and without the previous or concurrent appearance of external articular inflammation. It sometimes locates itself in the mucous membrane of the urethra, giving rise to a blennorrhœal discharge, resembling gonorrhœa. In old and gouty habits, the mucous membrane of the bowels sometimes becomes affected with the gouty irritation, producing muco-purulent discharges from the rectum;* and a similar discharge is still more common from the kidneys and bladders in such individuals. Hæmorrhages from the nose, lungs, kidneys, and womb, have been known to arise from gouty irritation; and Richter observes, that hæmorrhois are particularly apt to occur in gouty habits.†

Various cutaneous affections depend, sometimes, on a gouty condition of the system. Richter says, "there is a gouty *itch*, as well as *herpes*, which latter is apt to appear on the parts in which the gout is wont to appear, and particularly on the wrists and the ankles." Gilbert relates an instance in which a number of furuncles appeared, instead of a regular attack of the disease, in a person who had been long subject to hereditary gout.‡

Chronic gouty affection of the stomach may show itself by pyrosis; extreme sensibility of the stomach; bulmia; or total anorexia with gastralgia and flatulency. De Haen mentions a case, where the desire for food recurred at times so violently and suddenly, that if it was not immediately satisfied, severe pain in the stomach, with nausea and violent vomiting speedily ensued. Stoll relates an instance of spasmodic dysphagia from gouty irritation. Chronic gout, located in the bowels, sometimes gives rise to a colicky affection, with paralysis of the lower extremities, strongly resembling *colica pictonum*. The genital organs are occasionally affected by chronic gout, giving rise to painful and protracted priapism, and pollutions. The uterus too, often becomes the seat of gouty irritation, particularly about the period of the final cessation of the catamenia. "A state of chro-

* Reil's Fiebrlehre, b. iii. p. 596.
† Specielle Therapie, tom. 6. p. 571.
‡ Dict. des Scienc. Med. tom. xix. p. 117.

nic inflammation of the uterus ending in a kind of enlargement and induration of this organ, is occasionally the consequence of this affection." (Richter.) Chronic pectoral affections are extremely common in old people who have been much afflicted with gout. Cough, dyspnœa, asthma, with copious mucous expectoration, or occasional violent and distressing sanguineous engorgements of the lungs, (apoplexia pulmonum) are the usual occurrences in cases of this kind. It would seem too, that retrocedent gout is not unfrequently the cause of hypertrophy, ossification, and other organic affections of the heart. (Kreysig.) Pott mentions a case of hydrocele, which disappeared on the occurrence of a regular paroxysm of gout; and it is stated by Musgrave, that chronic gout sometimes assumes the character of scurvy. There is, indeed, scarcely any form of acute and chronic disease which may not arise from gouty irritation, and almost every organ or structure of the system may be the seat of its ravages.

Diagnosis.—The only affection with which gout is apt to be confounded is rheumatism; and there exists, indeed, a very close resemblance between them, although sufficiently diverse, in several essential circumstances, to justify their being regarded as distinct forms of disease. The principal points of difference between these two affections, have already been mentioned under the head of rheumatism, and need not therefore be repeated in this place.

Causes.—Gout, unlike rheumatism, requires a peculiar constitutional habit or *predisposition*, before any exciting cause can develop the disease. This predisposition is frequently *hereditary*, and perhaps still more frequently *acquired* by certain habits of living. Where the predisposition is very strong, and this will generally be the case when it is derived from both parents, scarcely any precautions in avoiding its usual exciting causes are sufficient entirely to obviate some manifestations of the disease. It is asserted by some writers, that however considerable the gouty predisposition may be, the disease occurs but exceedingly seldom, and some assert never, before the age of puberty. Richter, however, affirms that the disease sometimes, though indeed very rarely, occurs even in childhood. This predisposition does not manifest itself in early life, by any obvious defect of constitutional vigour or health. The children of gouty parents are as apt to be strong, robust, and to possess apparently as vigorous digestive and assimilative powers, as those born from parents of the most healthy habits. Barthez, however, observes that the hereditary predisposition to this disease is generally attended with a peculiar physiognomical expression, by which an experienced eye may detect its existence.* The

* Barthez. Traité des Maladies Goutteuses. Paris, an. 10.

age at which gout usually first shows itself, is between the thirtieth and fortieth year. Women are much less subject to this disease than men; and in its regular and acute form, located in the feet, it is almost exclusively confined to the latter sex. When gout does occur in females, it is almost always after the period of the final cessation of the menses, and in them it usually assumes somewhat of an atonic or irregular character. Hippocrates observes, that eunuchs are never affected with gout; an observation which is, however, contradicted by Dreysig* and others.

The *causes* which are especially calculated to *produce* a predisposition to gout in habits free from a hereditary diathesis favourable to this disease, are, the habitual and superabundant use of rich, nourishing, and strongly seasoned articles of food, particularly animal diet; and the free indulgence in vinous or fermented liquors, in conjunction with an indolent, inactive, and luxurious course of life. *Vinous* liquors are much more apt to lay the foundation of gout than distilled *alcoholic spirits;* and of the former it would appear that *Champaigne*, *claret*, and *port*, have a considerably stronger tendency in this way than *Madeira*, *Lisbon*, and *Sherry*, "because in addition to their equal or greater heating effect, they give rise to more acidity in the primæ viæ." (Scudamore.) Dr. Rush, in reference to the comparative tendency of wine and ardent spirits to produce gout, observes that the effects of the latter are too sudden and violent to admit of their being thrown upon the extremities, and that they appear only in visceral obstructions, and a complicated train of chronic diseases. "The effects of wine," he says, "like tyranny in a well-formed government, are felt first in the extremities; while spirits, like a bold invader, seize at once upon the vitals of the constitution." Indolence, or an inactive course of life, contributes powerfully to the production of the gouty diathesis. Neither rich and high-seasoned food, nor the free indulgence in vinous potations, are apt to produce the predisposition to gout where it is counteracted by a laborious or very active course of life.

The principal exciting causes of gout are, intemperance in eating and in the use of spirituous liquors; suppression of habitual evacuations; violent or depressing mental affections; cold and humidity; redundancy of acid or bile in the primæ viæ; fatigue both of body and mind; intense and protracted study; external injuries; the abuse of mercurial remedies; excessive evacuations, particularly sanguineous discharges; excessive venereal indulgence; and a sudden change from an abundant and nourishing to a spare and innutritious diet.

* Anfangsgr. der pract. Arzniew, p. 711, as quoted by Richter—Specielle Therapie, b. vi. p. 605.

Proximate cause.—In relation to the *proximate* cause of gout, a very great variety of opinions have been expressed by pathologists. The hypothesis which has obtained most credit, in reference to the pathology of this disease, is that which ascribes it to a peculiar morbific matter in the blood. It has been supposed to depend on an excess of *uric acid* in the system; since, according to the observations of Wollaston, there always exists a redundancy of this acid in gouty persons. Berthollet thought that an excess of *phosphoric acid* constitutes the proximate cause of the disease—an opinion to which he was led from having observed that the urine of gouty individuals was much less charged with this acid during the absence of the active state of the disease than in healthy persons; but that it became abundant on the approach and during the continuance of the gouty paroxysm. Some have contended, that instead of a superabundance of an animal acid in the system, the *materia arthritica* is of an alkaline character. It is asserted by Petit, that the perspiration of a gouty patient has been known to turn the tincture of violets into green colour.* The theory of Herissant, and in general, the identity of the nature of urinary calculi, and of gouty concretions, though apparently confirmed by the experiments of Scheele, has been fully confuted by Wollaston—since, from his experiments, it appears that gouty concretions always contain *lithate of soda*, which, according to Fourcroy, never enters into the composition of urinary calculi.† Scudamore has entered into an elaborate experimental examination of the two former of these doctrines. In relation to Wollaston's hypothesis, he ascertained by experiment, that the appearance and quantity of *uric acid* is always connected with, and proportionate to the unhealthy state of the chylopoietic function, but neither necessarily nor regularly an attendant on gout. With regard to the opinion of Berthollet, his experiments show that although an increased secretion of phosphoric acid in the urine occurs in the paroxysm of gout, yet the same takes place in other diseases; as for example, in diseases of the liver, and in some forms of fever. It is evident, therefore, that the chemical products which occur in gout are various, and that they are to be regarded rather as the *effects* of a peculiar morbid condition of the organization, than as the proximate cause of the gouty phenomena—or as furnishing any evidence of a *specific* gouty matter in the system. (Richter.) Without, however, referring to any other doctrines on this head, it may be observed, that disorder and debility of the digestive functions is one of the most constant precursory, as well as concomitant occurrences of an attack of this disease.

* Dict. des Sciences Med. t. xix. p. 162.
† Richter's Specielle Therapie, b. vi. p. 634.

From the constant attendance of this gastric disorder, Broussais and some other writers have been led to regard the disease as primarily located in the primæ viæ, and as depending on a peculiar irritation in the mucous membrane of the alimentary canal. The dynamic doctrines of Stahl, Cullen, Barthez, Sprengel, and others, are even less satisfactory than those which place the proximate cause of the disease in some morbid disposition of the blood. It can nevertheless scarcely be doubted, that some defect or derangement of the *reproductive functions* lies at the bottom of the evil; and that this primary dynamic disorder, in conjunction with its consequent *humoral* depravation, constitutes the fundamental pathological condition of the system in gout.

Treatment.—The treatment of gout divides itself into that which is proper during the paroxysm, and that which is appropriate during the intervals of the fits. To obviate or postpone the recurrence of the disease after it has once made an attack, an abstemious course of digestible diet must be enjoined, and the use of wine and other fermented liquors interdicted. Various remedies have been recommended during the premonitory stage, with the view of preventing the development of the approaching paroxysm, or of moderating its violence—all of which, however, are much more apt to prove injurious than beneficial, and ought to be rejected as hazardous.*

During the attack of the disease, the general treatment must be more or less antiphlogistic, according to the degree of general phlogistic excitement present. Unless the system is very plethoric, and the habit vigorous and inflammatory, bleeding may be well dispensed with. Under no circumstances, indeed, can this evacuation be regarded in any other light than a doubtful auxiliary; and, when carried to a great extent, may do serious injury by favouring metastasis to internal organs. It is true, instances are mentioned where the local affection was speedily removed by prompt and copious abstractions of blood, without any immediate evil consequences; but the cases where this practice was productive of dangerous effects, are sufficiently numerous to demonstrate its dangerous tendency when very actively employed. I am well aware that there are eminent authorities on the side of decisive blood-letting in this affection. Heberden, Rush, and Hamilton, insist strongly on the propriety of venesection in gout; but the present sentiment of the profession is

* The following means have been advised in the forming stage of the disease, in order to moderate or prevent the paroxysm. Emetics, (Chalmers;) active cathartics, (Musgrave;) vegetable bitters, iron, and high-seasoned food, (Grant;) Dover's powder or antimonial wine with opium, (Fothergill;) large doses of musk or castor, (Williams;) gratiola, (Wolff;) bleeding from the foot, (Gilbert;) the application of very cold water to the feet, (Giannini;) the internal use of iced-water, (Barthez;) &c.

opposed to this measure as a *principal* remedy; although, moderately employed, it is generally admitted to be useful under symptoms of high vascular excitement.

Cathartics are decidedly beneficial in the attack of regular gout. The alimentary canal is always more or less loaded with dark-coloured, vitiated, and irritating matters, which should be as speedily evacuated as possible. Scudamore recommends the following pills—a combination which I have used with very good effect.* He advises the exhibition of cathartics and diuretics conjointly, as particularly useful in the gouty paroxysm. "I have experienced the most remarkable success," he says, "from a draught composed of magnesia gr. xx.; sulphat. magnesiæ, ʒiss.; vin. colch. ʒiss. with a little sweetened water. This draught should be repeated at intervals of four, six, or eight hours, according to the freedom of its operation and the urgency of the symptoms." The bowels should be kept freely moved throughout the paroxysm.†

Emetics also have been recommended in the treatment of gout; and where the symptoms of redundancy of acid, or bile, or other offending matters in the stomach, are unequivocal in the commencement of the disease, advantage may, no doubt, be obtained from the administration of an emetic. As a general rule, however, emetics are inappropriate in this affection. They are indicated when there is much nausea, vomiturition, acidity in the stomach, with a furred and foul tongue, or where the disease supervenes soon after a hearty meal. Ipecacuanha should be employed for this purpose in preference to antimony.

For the purpose of keeping up a gentle diaphoresis, we may employ opium in combination with calomel and tartar emetic with much advantage, after the bowels have been freely evacuated by purgatives. A grain of opium with the same quantity of calomel and one-tenth of a grain of tart. antim. may be given every four or six hours—assisted by copious draughts of infusion of elder flowers, or of eupatorium perfoliatum. I have used the diaphoretic mixture, given at page 147 of this work, with the addition of a drachm of laudanum, with excellent effect.

To moderate extreme suffering from the gouty inflammation, and to procure the patient some repose, *opium*, under proper management, is both a safe and a highly useful medicine.

"On many occasions," says Scudamore, "when the patient

* ℞. Extract. colocynth. compos. ʒss.
Calomel gr. 15.
Tart. antimon. gr. i.
M. Divide into sixteen pills. S. Two or three to be taken on going to bed.

† Boerhaave, Warner, and some other writers, reject purgatives wholly from the list of remedies proper in this disease; but their apprehensions in this respect are without foundation.

has described the pulsatory throbbing of the inflamed part to resemble almost the successive blows of a hammer, when the heart has been in inordinate action, and the inflammatory diathesis has appeared altogether urgent, I have stood by the bedside and witnessed the happy power of a free administration of opium, in causing an abatement of the action of the vessels, and producing universal tranquillity in a short time." I have myself employed opium in this affection with the happiest effect. Not only is the extreme pain allayed, but the sympathetic febrile excitement also is generally conspicuously moderated by full doses of this narcotic. The bowels should be freely evacuated before recourse is had to this medicine. It may be given in doses of one grain, either by itself or as mentioned above, with calomel and tart. antim. every hour or two until the local pain is allayed. When opium disagrees with the stomach, the *black drop*, or the *liquor opii sedativus* of Dr. Battley, should be employed.*

A great number of *specifics* and *nostrums* have at different times acquired a temporary reputation for their usefulness in this disease; of which, however, a few only need be mentioned.

The *colchicum autumnale*, which would seem to be the hermodactyl of the ancients, is now universally admitted to be an article of great powers in removing gouty inflammation. It is not, however, admitted on all hands to be a very safe remedy; for, it is asserted by some, "that it is apt to leave the predisposition to the disease much stronger in the system; to lead to the still more calamitous, because still more constant, pains of the chronic form of the disease," (Scudamore.) That the objections which have been urged against this article are altogether unfounded, I am not disposed to affirm; but I think it highly probable, that much of the harm which has been ascribed to it has arisen from the improper or inordinate use of the remedy. I have used it in about a dozen instances with marked advantage, and so far as I have ascertained, without any prejudicial consequences whatever. Even Scudamore, whose objection to this article I have just quoted, observes, that under judicious management it may be employed with perfect safety, and almost always with decided benefit. He gives it with magnesia and Epsom salts, according to the formula mentioned in the preceding page. I have usually directed from 30 to 50 drops of the vinous tincture with about 20 grains of magnesia, to be taken every six hours until it acts on the bowels. When it produces nausea, or other unpleasant sensations in the stomach, its use must be discontinued.

The *eau medicinale* is a celebrated nostrum, which has been

* Opium is very favourably mentioned as a remedy in this disease, with the view of moderating the patient's sufferings, by Sydenham, Warner, and Richter.

extensively used in France ; and its powers of shortening the paroxysm are said to be surprisingly great. It is now generally admitted, however, that in its ultimate consequences it often proves highly injurious. When first used, it rarely fails to remove the gouty inflammation speedily ; but its powers in this way are gradually diminished by repetition—producing at last great derangement of the digestive functions, permanent nervous irritation, giddiness, trembling, coldness, and œdema of the extremities, and other manifestations of infirm health. The tincture of *white hellebore* and laudanum has also been found promptly efficient in removing gouty inflammation, but it is said to be as pernicious in its consequences, and even more so, than the *eau medicinale.*

Local remedies.—Various local applications have been employed in the treatment of gouty inflammation ; but the majority of them are useless, and indeed often prejudicial. Neither leeching, nor blistering, nor warm pediluvium, appear to be calculated either to relieve the pain, or to promote the resolution of the local affection. Leeching even sometimes increases the pain. Some have advised the application of cold water to the inflamed joint—a measure which will, indeed, often moderate the pain and inflammation, but its particular tendency to cause a retrocession or translation of the disease to internal organs, renders it objectionable.* Scudamore observes, that the best local applications are such as are volatile and stimulating. He strongly recommends a liniment composed of one part of alcohol and three parts of *mistura camphorata,* which is to be applied to the affected part in a lukewarm state, by means of several folds of linen strips saturated with it. I have employed this lotion in several instances with decided benefit. Its good effects were manifested by a speedy mitigation of the heat and pain of the affected part. The application of ether will also afford relief by its rapid evaporation, and consequent subduction of the heat and local excitement of the inflamed joint.

Wrapping the part in flannel was formerly regarded as the most safe and beneficial application ; but "flannel and patience" have very properly grown out of fashion ; for this application tends to protract the paroxysm, and to aggravate the sufferings of the patient, without affording any peculiar advantages as to the future health of the patient. Where there is slight or incomplete development of the gouty inflammation in the extremities, with a tendency to retrocession, benefit may, no doubt, be derived from the application of flannel or cotton to the part ;

* The practice of applying cold water to the inflamed joint in gout is recommended by Hippocrates—(*Aphor.* sect. v.)—Kinglake employed cold poultices. —*Med. and Phys. Journal,* No. 24.

but, in the regular and fully developed attack, it is at best useless, and often distressing.*

During convalescence after an attack of gout, a temperate and moderately nourishing diet, with regular exercise and the occasional use of mild laxatives, should be enjoined. When the biliary and digestive functions remain disordered, which is very commonly the case after violent and protracted paroxysms, small doses of blue pill in the evening, with an occasional laxative and a weak infusion of colomba or gentian in small but repeated doses during the day, should be used.† To remove the protracted swellings which sometimes remain, stimulating liniments may be usefully employed; or, as Scudamore recommends, a flannel roller applied to the affected part.

The remedies or prophylactic means that have been recommended during the intervals of the paroxysm, with the view of moderating the gouty diathesis, or of preventing the recurrence of the disease, are very numerous. Little or no dependence, however, is to be placed on any measures in this respect, except on such as are calculated to restore the healthy action of the stomach, liver, and skin; and especially on the adoption of proper regulations, with regard to diet and exercise. Abstinence from high-seasoned and very nourishing diet, and from all kinds of fermented liquors, with regular exercise in the open air, a constant attention to the maintenance of the healthy action of the bowels, liver, and skin, by the occasional use of laxatives, blue pill, and weak infusions of some of the tonic vegetable bitters; and the wearing of flannel next the skin, will, perhaps, do all towards resisting the progress of the disease that can be effected by remediate means. According to the experience of Scudamore, the ammoniated tincture of iron, commencing with 20 drops twice daily, and gradually increasing the dose to 60 drops, is an excellent tonic during the intervals of the gouty paroxysm.

In the treatment of the *chronic form* of the disease, the principal attention must be directed to the chylopoietic organs. A light and digestible diet, with an occasional blue pill in the evening, followed in the morning by a gentle laxative, are among the most useful remediate measures in this variety of the disease. To relieve the nervous irritation and pain, generally so distressing during the night, we may give one or two grains of opium, or from 15 to 20 drops of *black drop* at bed-time. Scudamore

* A great variety of other local remedies have been favourably mentioned —namely, the warm steam-bath, (Percy;) the split leaves of the *cactus crocus*, emplast. hyoscyam. spread on oiled silk, (Thilenius;) emplast. opii; cataplasms of conium, belladonna and hyoscyamus, and *moxa*.

† As an aperient during convalescence from gout, Warner's gout cordial is an excellent remedy. The formula for making this tincture is as follows; ℞. Rhubarb ʒi. senna ʒss. saffron ʒi. liquorice root ʒiv. raisins ℔i. brandy ℔iii. Digest for a week, and strain.

recommends lactucarium and stramonium in combination, as a very useful narcotic in such cases. Opium in union with camphor, forms also an excellent anodyne in instances of this kind. The carbonate of ammonia, or from 20 to 30 drops of a solution of camphor in sulphuric ether, (℈iii. of camph. to ℥i. of ether) or warm ginger-tea, may be usefully administered, to relieve the spasmodic and nervous pains in the stomach, which are so common in the chronic form of gout. A vast variety of remedies have been recommended for the removal or mitigation of chronic arthritic affections. Amongst these, however, there are very few that are worth being mentioned. Gum guaiacum; ol. terebinth; calamus aromaticus, (Rave, C. L. Hoffman); and particularly the vegetable bitter tonics; aconitum, (Richter); the bark of the *prunus padus*, (Horn's Archiv. 1812); chalybeates; herba rhododend. chrysanthi; belladonna; mercurial remedies; and the use of sulphurous mineral waters, are the principal articles of this kind. Rave, a German writer, speaks in very favourable terms of *savin (juniperus sabina)* in chronic gouty inflammation of the joints.* I have known much benefit derived from this article in chronic or subacute arthritic affections, more especially in subacute rheumatic inflammation. Rave recommends the following formula for taking the savin.† In an atonic, torpid, or sluggish state of the system, with chronic gouty symptoms, the following composition, recommended by Quarin, will sometimes act very beneficially.‡ Alkaline remedies have also been supposed peculiarly adapted to counteract the gouty diathesis, but they appear to be of little or no value in this respect. Formerly, the *liquor antiarthriticus Elleri* was much in vogue as a remedy in chronic gouty affections. It consists of equal parts of sulphuric ether and aq. ammon. succinata. The dose is from 30 to 40 drops.

When the gouty inflammation leaves its external seat, and fixes on some internal organ, prompt and active remediate measures are necessary to obviate the immediate danger. Cullen recommends heating and stimulating remedies in retrocedent gout: where the disease attacks the stomach, this, without doubt, is

* Beobachtungen und Schlüsse aus der praktischen Arzneywissenschaft. Von Alexander Rave. Munster, 1796.

† ℞ Herb. sabin. recens. ℥ii.
Tinct. antimon. acris. ℥vi. M. digere per 3 vel 4 dies.
Or—℞. Pulv. hb. sabin. recens. ℥ss.
Antim. crud. gr. xii.
Flor. sulp. gr. xv.
Camphor. gr. iv. M. f. pulv. pro dos. This dose is to be taken twice or thrice daily.

‡ ℞. Flor. sulph. ℥i.
Resin. guaiac. ℥ss.
Antim. crude ℥iii. M. f. pil. pondere gr. iii. S. Take from six to eight pills, three times daily.

often the best practice. Laudanum in large doses, (from 80 to 100 drops) with warm spiced brandy, should be freely administered; and a large sinapism applied over the region of the stomach. Opium, in the form of tincture, is a most valuable medicine in cases of this kind. Even where the translated affection assumes the character of acute gastritis, and where the aromatic and diffusible stimulants are improper, the greatest relief will often follow the exhibition of large doses of this narcotic. When the *brain* becomes the seat of the translated disease, stimulants and opiates are inadmissible. In such cases, our principal reliance must be placed on the speedy and copious abstraction of blood, together with the use of active mercurial cathartics, cold applications to the head, and sinapisms to the feet. In all instances of translated gout, stimulating or rubefacient applications to the feet are decidedly indicated. Irritating purgative enemata also are useful, as well as cupping and leeching over the region of the affected organ.

CHAPTER XV.

OF THE INFLAMMATORY AFFECTIONS OF THE EYES.

1. *Catarrhal Ophthalmia.*

This is the most common form of ophthalmia in adults, and proceeds, as its name imports, from the influence of atmospheric vicissitudes, and especially from cold and damp night air. The inflammation in this variety of the disease is confined chiefly to the conjunctiva and the meibomian glands. The patient complains of pain, intolerance of light, and a *constant sensation of sand in the eye*—which latter feeling may, according to Mr. Mackenzie, be regarded as a diagnostic symptom of this variety of ophthalmia.* In mild cases, the redness of the eye is not very great, and is most conspicuous in the conjunctiva lining the eyelids. The flow of tears is always much increased; and in severe cases, the secretion often becomes opaque and purulent. Chemosis sometimes takes place in very violent instances, and the cornea may burst and destroy vision. The headach in this variety is seldom very severe, and the febrile excitement is generally mild, and in slight cases altogether wanting.

* Med. and Phys. Journal, No. 4. 1826.

Treatment.—In mild cases of this variety of the disease, general blood-letting is rarely necessary or useful. In instances attended with considerable constitutional irritation, a sufficient quantity of blood should undoubtedly be drawn, to moderate the excessive momentum of the circulation. *Leeching* rarely affords any decided advantage; when local depletion is desired, cupping on the back of the neck and over the temples is preferable. Mr. Travers condemns scarification of the conjunctiva, and bleeding from the angular vein, in the acute form of the disease, although highly beneficial in the chronic. Nevertheless, when *chemosis* occurs, and the discharge becomes puriform, considerable advantage will, in general, result from scarifying the conjunctiva of the eye-lids. "One or two deep incisions being made along the inner surface of the upper or lower eye-lid, a very considerable discharge of blood will immediately take place, and prove a valuable means of cure in cases of this kind. The eye-lid, after the incision, ought to be alternately everted and permitted to return to its natural position, by which means the divided vessels are refilled, and thus a continued flow of blood be produced." (Mackenzie.) In cases of this character, considerable benefit often accrues from the use of nauseating doses of tartrate of antimony, given at short intervals, so as to keep up a continued and uniform impression.

Cathartics are indispensable in this affection. The bowels must be freely opened by a full dose of calomel and jalap, or by active doses of the neutral purgative salts, and kept in a loose state throughout the course of the disease.

The usual astringent lotions do no good in this variety of the disease; indeed, they often prove manifestly prejudicial. The solutions of sulphate of zinc or of acetate of lead, so commonly used in inflammations of the eye, seldom fail to increase the redness of the conjunctiva and the sensation of sand in the eye. The same observation applies to *cold* applications; for, although they generally produce temporary ease, "they are followed by reaction, with an increase of heat and pain." (Travers.) In the acute stage of the inflammation, benefit will frequently arise from the use of warm soothing fomentations to the eye. A weak infusion of poppy, or simply warm water and milk, may be used for this purpose. Emollient and soothing warm applications must not, however, be continued too long; for they tend to relax and to produce œdematous elevation of the conjunctiva. When the disease early assumes an atonic or almost solely congestive character, a few drops of the vinous tincture of opium, or of solutions of zinc, or nitrate of silver, will often afford much relief. The *nitrate of silver* is decidedly the most effectual local application in this variety of ophthalmia. Four grains of this article dissolved in an ounce of distilled water, forms a solution

of a proper strength; "a large drop of which is to be applied to the eye by means of a camel-hair pencil. The instant that it touches the eye, the salt is decomposed, and the silver precipitated over the conjunctiva in the state of a muriate."* An abatement of the peculiar sensation of sand and of the inflammation, almost uniformly soon follows the application of this solution. I have myself employed the nitrate of silver in this way with almost uniform advantage.

Mackenzie recommends also a solution of one grain of corrosive sublimate in eight ounces of water as a collyrium, to be used, milk warm, thrice daily, for fomenting the eye-lids by means of a fine piece of linen, and allowing a few drops to pass into the eye. In cases of great severity, where the secretion is puriform, he directs "this collyrium to be injected over the whole surface of the conjunctiva, and especially into the upper fold of this membrane, by means of a syringe."

An ointment made "by levigating twelve grains of red precipitate till they become an orange-coloured impalpable powder, to which an ounce of fresh butter is to be added, forms also a a very useful application in this variety of ophthalmic disease." A very small portion of this ointment is to be applied along the edges of the eye-lids at night on going to bed. Kopp speaks very favourably of the tincture of galbanum as a local application in ophthalmic inflammation. A compress of linen is to be moistened with this tincture and laid over the closed eye-lids. I have used this application with marked benefit in several cases, after the acute stage of the inflammation had in a degree subsided.

In some instances of a general irritable habit of body, the ophthalmia will continue to grow worse under the ordinary depletory measures, "the irritability increasing as the strength fails." In cases of this kind, recourse must be had to calomel and opium in combination, or opium with small doses of tart. antimony or ipecacuanha. From three to four grains of Dover's powder with the sixth of a grain of calomel, may be given every three or four hours, at the same time that the above exciting applications are made to the eye. *Blistering* on the back of the neck, particularly after proper depletion, will almost always assist materially in the reduction of the inflammation.

In violent and protracted cases of the disease, the inner surface of the upper eye-lid sometimes becomes rough, with a species of hard fungoid elevations, resembling a state of sarcoma of the conjunctiva. Where this occurs, it should be lightly touched with lunar caustic or a piece of sulphate of copper—the

* Mackenzie, loc. citat.

eye-lid being held up from the eye-ball for a minute or two after the application.

Ophthalmia sometimes assumes a *strictly periodical form.* The attack in such cases is usually attended with intense suffering; and under the usual antiphlogistic plan of treatment is apt to continue a very long time. In instances of this form, leeching, blood-letting, and cooling applications, never fail to do harm. The appropriate means consist of the same remedies that are employed in intermitting neuralgia, or in the ordinary intermitting fever; and there can exist but little doubt that all these forms of periodical disease are congeneric affections. Quinine, bark, and arsenic, will, in general, speedily arrest the progress of the present variety of ophthalmia.*

2. *Rheumatic Ophthalmia.*

This variety of ophthalmic inflammation is chiefly characterized by violent circumorbital pain, extending to the temples, teeth, lower jaw, and internal ear. The pain is continuous, with occasional fits of aggravation, and is almost always much more severe at night than during the day. The white of the eye is of a yellowish red tinge, terminating abruptly at the cornea—which latter becomes dull, cloudy, and as the disease advances, more opaque in the centre than at the circumference. According to the observations of Travers, "rheumatic ophthalmia presents a zonular arrangement of the vessels, more or less cloudiness of the aqueous humour, and a pupil displaced or drawn a little to one side." The flow of tears is at first diminished; but in the course of the disease it becomes copious. In most instances, slight abrasions of the conjunctiva and cornea occur; but these are generally so minute and superficial as readily to escape observation, unless closely inspected. In violent and protracted cases, the cornea is sometimes destroyed by ulceration, and pus is secreted within the chambers of the eye.

The inflammation, in this variety of the disease, is confined chiefly to the *fibrous* structures of the eye and of the surrounding parts; and partakes in this respect of the character of rheumatism. It is excited by the same causes that give rise to the catarrhal variety; and occurs most commonly in persons of an arthritic or rheumatic diathesis. It is also particularly apt to occur from the influence of cold while the system is under the operation of mercury, or soon after the mercurial action has subsided. "It is often seen in company with, or following gonor-

* For an interesting case of this kind, see Journal Complement. Jan. 1830. See also Med. Chir. Rev. March, 1830.

rhœa, eruptions, or sore throat of a pseudo-syphilitic character, and the pains are allied to those which succeed to the exhibition of mercury.*

Treatment.—Bleeding very rarely affords any obvious advantages in this variety of ophthalmia. When the pulse is very active, it should, nevertheless, be moderated by venesection, in order to lessen the general phlogistic diathesis, and thereby favour the beneficial operation of the more appropriate remedies. Much advantage may sometimes be derived from one or more antimonial emetics in the early stage of the disease; and active purgatives are equally important. After the alimentary canal has been well evacuated, we may exhibit a solution of tart. antimon. in nauseating doses, every two or three hours; or antimonial powder in combination with opium and calomel, so as to keep up a uniform, continued, moderate diaphoresis.† I have known much good done in this variety of the disease by repeated small doses of Dover's powders. Cupping or blistering the nape of the neck is a useful auxiliary; and fomentations with an infusion of poppy heads, always mitigates the pain very considerably. One of the most soothing applications to the eye, is a few drops of an aqueous solution of opium put into it several times a day, or a solution of the sulphate of morphia. Puncturing the cornea, so as to give exit to the aqueous humour, is almost always soon followed by an abatement of the inflammation and pain. The usual astringent and exciting collyria are wholly inapplicable in the treatment of this affection, and almost uniformly do injury. Mr. Wardrop recommends the internal use of cinchona in very small doses, (from five to eight grains,) if the tongue remains white after the bowels have been freely evacuated. Would not the tincture of colchicum be beneficial in this affection?

3. *Purulent Ophthalmia.*

Acute suppurative inflammation of the conjunctiva is the most dangerous variety of ophthalmia, and generally the most difficult to manage. It occurs, however, under every grade of violence, from a mild and simple to a most severe and rapidly destructive affection. The severer cases come on suddenly, and are from the beginning attended with very severe darting pains through the eye. The eye-lids swell rapidly, and often to an enormous extent,—the upper one being often so much enlarged as to rest

* Travers—A Synopsis of the Diseases of the Eye, &c. p. 129.

† ℞. Pulv. antimonialis ℈i. Calomel gr. iii. Pulv. opii gr. iiss. M. Divide into nine equal parts. Take one every three hours.

upon the cheek. The conjunctiva also becomes so much swollen by infiltration and distention of its vessels, as to rise up in an annular mass of red spongy granulations, overlapping the cornea so as almost to conceal this part. A very copious purulent secretion from the inflamed conjunctiva takes place soon after the disease is developed—and which usually issues in large drops from under the swollen lids. The edges of the eye-lids are sometimes so closely pressed against each other, as to confine the matter until it accumulates and distends the lids into a large round tumour, and at last bursts forth and runs down the cheek. The pain in the head is always extremely severe, and the whole system sympathizes strongly with the local affection—the accompanying fever being of a high synochal grade, suffering conspicuous exacerbations in the evening. Under judicious treatment, this severe form of the disease usually begins to decline about the third or fourth day, and gradually subsides until the health of the eye is restored. Cases of great severity, or where the treatment is inefficient or improper, often terminate rapidly in more or less disorganization of the eye and consequent loss of vision. Sometimes every part of the ball of the eye becomes disorganized by suppuration. Much more commonly, however, the consequences are not so destructive,—a greater or less degree of opacity and thickening of the cornea, or ulcerative destruction of this part, being usually the result of the inflammation. In some instances, ulceration of the proper substance of the cornea takes place beneath the conjunctiva—this membrane remaining entire. (Travers.) This "*interstitial*" ulceration of the cornea, says the author just referred to, may be either acute or chronic. The acute variety is often crescent-shaped, and passes nearly across the whole cornea. In consequence of the absorption or abrasion of the conjunctiva, directly over the ulceration of the cornea, great pain is caused by the motions of the upper eye-lid. The chronic interstitial ulcer occurs in debilitated subjects, remaining often a long time like a slight depression or excavation on the surface of the cornea, the restorative action of the vessels of the part being inadequate to repair the lost structure. Gangrenous destruction of a greater or less extent of the cornea may also take place in suppurative ophthalmia.

In the milder variety of purulent ophthalmia, there is little or no danger of destruction of the cornea, unless injury be done by stimulating applications. Mr. Travers says, "that a very slight haze of the cornea is the worst direct result of the mild form of the disease." In cases of this kind there is neither the intense pain, nor the excessive swelling of the lids, which characterize the violent acute form of the complaint.

There appear to be different varieties of suppurative ophthalmia, in relation to the exciting causes of the affection. The

Egyptian ophthalmia, which is the most violent form of this disease, is ascribed to the combined effects of vicissitudes of atmospheric temperature and humidity, a hot wind loaded with fine particles of sand, and a bright and piercing light of the sun. A violent form of purulent inflammation of the conjunctiva, is also excited by the application of gonorrhœal matter to the eye; and it is said, by metastasis of gonorrhœal inflammation from the urethra to the conjunctiva. *Infants* also are subject to purulent ophthalmia; but in them the disease is generally much less serious than in adults. Mr. Gutherie states that there are two varieties of infantile suppurative inflammation of the eyes: "one affecting the conjunctiva of the lids only, the other implicating the eye-ball." I have repeatedly noticed these distinctions in the ophthalmia of infants; and although little or no permanent injury need be apprehended from the former variety, I have found it even more difficult to subdue than the latter. Some writers attribute this affection in infants to intestinal irritation from bile and sordes in the primæ viæ; but the opinion of its being almost universally the consequence of the direct application of some morbid secretion to the eyes at the time of birth, is, I think, by far the most probable. I have never known a single instance of this disease occurring in infants, soon after birth, where, upon inquiry, I did not learn that the mother had been affected with leucorrhœa, or some other morbid vaginal secretion. The fact, too, that the ophthalmic discharge in cases of this kind, is capable of exciting the same disease when applied to the eyes of others, furnishes a strong argument in favour of this etiology. Mr. Ryall, whose opportunities for observation on this subject have been very extensive, states that he has repeatedly known the ophthalmia excited in nurses, "by the accidental application of the matter from the infant's eyes to their own."* Purulent inflammation of the eyes occurs, no doubt, occasionally in infants as in adults, from cold, and various irritating causes, acting directly on the eyes; but this is comparatively, perhaps, but very rarely the case.

Treatment.—In mild cases, where the swelling, pain, and purulent secretion are not great, general blood-letting is not often necessary. In the severer form of the complaint, however, prompt and very decisive bleeding is indispensable to success. In those vehement cases, where the swelling of the lids is very great, the purulent secretion copious, the pain intense, and the pulse hard and frequent, "the instant relief, says Mr. Travers, of a large venesection, is indescribable. The pain is mitigated if not removed, the pulse softened, and the patient sinks into a sound sleep, and perspires freely. Upon inspection we observe

* Dublin Transactions, vol. iv.

the high scarlet hue and bulk of the swollen and fungoid conjunctiva sensibly reduced, and the cornea has a brighter aspect."* It is frequently necessary to repeat the venesection several times, in the course of the first twenty-four hours, before permanent impression is made on the disease.

In the disease, as it occurs in infants, blood must be abstracted by a few leeches applied to the external angle, or under lid of the eye; and the eye should be frequently fomented with a decoction of poppy heads, a portion of which is to be injected under the lids to wash away the purulent secretion. Minute portions of calomel in union with ipecacuanha, or pulvis antimonialis, with an occasional dose of castor oil, should be given to infants labouring under this affection.†

Topical bleeding, after the vigour of the arterial action has been moderated, by a very efficient abstraction of blood from the arm, will generally assist materially in reducing the local inflammation. From 20 to 30 leeches may be applied to each temple and around the eye. Blistering on the nape of the neck, is also a very useful auxiliary; but decisive blood-letting should precede the application of the blister. One of the first and most important remediate measures, is the exhibition of an active mercurial purge, and the bowels must be kept freely moved throughout the active stage of the disease, by the daily use of full doses of one of the neutral purgative salts. No nourishment except the simplest mucilaginous fluids, or toast-water, must be allowed; and in very vehement and rapid cases, total abstinence from any nutrient ingesta should be enjoined, during the first two or three days. Along with blood-letting and active cathartics, nauseating doses of tartar emetic are, in general, decidedly beneficial. They should be given in small doses every hour or two, so as to keep up a continued impression on the stomach. During the acute period of the inflammation, emollient fomentations, such as warm water, or infusion of the white poppy heads, will assist in mitigating the pain and promoting resolution; but all astringent and cooling applications are injurious. By the prompt and active employment of these antiphlogistic measures, the pain, irritation, and swelling usually begin to subside about the third or fourth day, and the discharge becomes gleety at the same time that the conjunctiva assumes "a pale and flabby appearance." If, when the inflammation has thus in part subsided, the cornea appear clear and bright, nothing need be apprehended as to the safety of the eye. Recourse must now be had to the exhibition of tonics and astringent and invigorating collyria. It would ap-

* Travers, loc. cit. p. 265.

† R. Calomel gr. ii.
Pulv. antimonialis gr. viii.
M. Divide into eight equal parts. S. Give one every four hours.

pear from the experience of Mr. Varlez, surgeon of the Military Hospital at Brussels, and of Mr. Gutherie, that the *chloruret of lime*, forms the best local astringent application we possess in this variety of ophthalmia. The former of these surgeons, states that he has employed this article in more than 400 cases of purulent ophthalmia with uniform success. After the local and general inflammatory condition is moderated by decisive depletion, a solution of this salt is to be applied to the inflamed conjunctiva. He usually employed it in the proportion of a scruple to an ounce of distilled water; but when the inflammation continues, and when the patient bears it without complaining, it may be used, he says, to the extent "of three or even four drachms in the same quantity of water."* It has been found equally beneficial in the purulent ophthalmia of infants. In two cases of this variety of the disease, I derived the most signal advantage from injecting into the eye a solution of 10 grains of the chloruret of lime to an ounce of water, repeated three times daily. The nitrate of silver, in the proportion of from two to four grains to an ounce of water, forms also an excellent local astringent in this affection. A few drops of this solution should be introduced into the eye twice daily. In the purulent ophthalmia of infants, after leeching, emollients, purging, and antimonials, have been employed, a weak solution of this article injected under the eyelids, is generally soon followed by the most favourable effects. Mr. Ryall says, that when the "discharge becomes profuse, assuming a greenish colour, all warm fomentations and cataplasms must be laid aside, and a solution of the nitrate of silver, in the proportion of two or three grains of the mineral to an ounce of distilled water, should be frequently and briskly injected between the lids."† Various other astringent and exciting lotions have been recommended after the acute character of the inflammation has been subdued. A weak solution of alum, one grain to an ounce of water, is recommended by Travers. Others advise the application of alum-curds confined between two folds of thin linen; and Ware speaks favourably of the following solution: ℞. sulphat. cupri. bol. arm. āā gr. viii. camphoræ gr. ii. misce et affunde aq. bullient. ℥viii. At first a drachm of this solution must be mixed with an ounce of water, and injected forcibly under the eye-lids; the strength being gradually reduced in proportion as the inflammation subsides.

Tonics, such as the cinchona or quinine, with the sulphuric or nitric acids, must be employed to sustain the patient's powers, after the inflammation has been reduced, and the conjunctiva appears pale and flaccid. "If, when the lowering practice

* Lond. Med. and Phys. Jour. 1827.
† Dublin Transactions, &c. vol. vi.

has been pushed to the extent of arresting acute inflammation, the patient being at the same time sunk and exhausted, the cornea shows a lack-lustre and raggedness of its whole surface, as if shrunk by immersion in an acid, or a gray patch in the centre, or a line encircling or half encircling its base, assuming a similar appearance, the portion so marked out, will infallibly be detached by a rapid slough, unless by a successful rally of the patient's powers, we can set up the adhesive action so as to preserve in sitû, that which may remain transparent." (Travers.)

4. *Scrofulous Ophthalmia.*

This variety of the disease occurs most commonly in children, and is frequently the first manifestation of the scrofulous diathesis. Its most characteristic symptoms are: extreme sensibility of the retina to the impressions of light; profuse serous secretion or flow of tears; and a muco-purulent secretion from the glands of the tarsi, which, during sleep, agglutinates the eye-lids. The pain is not often great, unless a bright light is suffered to fall upon the eye; nor is the redness of the conjunctiva generally very conspicuous. In recent and acute cases, effusion of serum sometimes occurs around the cornea, "elevating the conjunctiva into a circular vesication, about a line or more in breadth, frequently occupying the entire margin of the cornea, and exhibiting a peculiar reddish brown appearance."* In many instances of this acute character, minute vesicles appear scattered over the cornea and the conjunctiva of the sclerotic coat. "These pustules vary in size, according to the part of the conjunctiva on which they appear, being commonly smallest on the cornea, and increasing as they approach the angle where that membrane is reflected over the inner superficies of the lids, and may be considered as a distinguishing symptom of this disease." (Jeffries.) These vesicles break, in some cases, and form ulcers; and if the inflammation be not checked, these ulcerations often gradually penetrate deeper into the cornea, until they form an opening into the anterior chamber, and give exit to the aqueous humour.

The disease does not, however, often occur in this acute form, the majority of instances met with being of a strictly chronic character, the vessels of the conjunctiva "remaining in a state of passive congestion and engorged with red blood," with small indolent ulcerations, or nebula of the cornea, attended with a constant profuse flow of tears, and with such distressing intolerance of light, that the patient keeps the eyes constantly closed,

* Cases of Surgery, &c. &c. By Henry Jeffries, Esq. senior surgeon to St. George's and St. James's Dispensary. Lond. 1820.

and lies with the face downwards, or keeps the hands continually applied over the eyes to exclude the light as much as possible. In many instances of this chronic variety of the disease, *tinea ciliaris* and *lippitudo* occur; small pustular ulcerations appearing along the roots of the eye-lashes, from which a muco-purulent fluid exudes, by which the edges of the eye-lids are glued together; or the edges of the eye-lids are red, and excoriated.

Mr. Christian, consulting surgeon of the Liverpool Ophthalmic Infirmary, has described a variety of scrofulous ophthalmia, which he calls *porriginous*, from the disease being usually preceded by a porriginous "eruption of pustules on the face and head." These pustules go through the various stages of suppuration, ulceration, and desquamation; and if the eruption in its pustular form, shall have disappeared before the inflammation of the eyes have commenced, still there will almost always be found some traces of the original disease in the form of scabs, or fissures behind the ears, at the commissures of the palpebræ, or at the junction of the ali nasi with the cheeks."*

This appears to be the same variety of scrofulous ophthalmia, that has been described by Mr. Wardrop, under the name of exanthematous ophthalmia. Mr. Wardrop considers it as specifically distinct from the scrofulous form of the disease, though he admits that it very frequently occurs in subjects of a scrofulous habit. Neither the symptoms nor the treatment of this disease, however, differ so materially from those peculiar to scrofulous ophthalmia, as to justify the opinion that they are essentially distinct in their characters. "Eruptions of the scalp and discharges behind the ears, so frequent in children, are the affections with which this ophthalmia is most commonly connected. These diseases alternate with the disease of the eyes, the latter becoming affected when the eruption or discharge disappears; whilst when either of *these* returns, the eyes recover. This ophthalmia also sometimes succeeds measles, scarlet fever, and other exanthematous diseases, but usually appears a considerable time after these affections have subsided. The symptoms of the exanthematous ophthalmia are very characteristic; for, besides being connected with eruptions and confined to young people, the excessive intolerance of light, the enormous secretion of tears, and the relief from forcibly squeezing the eyes, are symptoms quite peculiar. The patient can scarcely hold up his head, and if he is desired to open his eyes, he is affected exactly as if he were looking on a mirror, reflecting a bright sunshine, every attempt causing a profuse gush of tears, and being instantly succeeded by a violent and involuntary squeezing of the eye-lids and knitting of the brows. He excludes all light, not only by holding

* Glasgow Medical Journal, No. i.

down his head and squeezing the eye-lids together, but by pressing a handkerchief firmly on them, or by resting his face against a chair in some dark corner of the room. The intolerance of light is always most severe in the morning; but in the afternoon it sometimes remits so much as to allow the patient to open his eyes and see to a very considerable degree for some hours. The tears are of an acrid and irritating quality, so that the cheeks, alæ of the nose and lips often become inflamed, swelled, and sometimes covered with pustules and cutaneous ulcerations."*

Now this very graphic account of the symptoms, answers in every particular to the descriptions given by authors of scrofulous ophthalmia, and it certainly describes the disease which I have always considered as the strumous, or scrofulous form of ophthalmia.

Treatment.—General bleeding rarely becomes necessary in strumous ophthalmia. In recent and acute cases, however, *leeching* should be occasionally practised, until the pain, irritation, and inflammation are moderated. *Purgatives* are indispensable in this affection, where the abdomen is tumid and tense, and the alvine discharges of an unnatural character. Calomel, combined with rhubarb or jalap, should be given every two or three days, in doses sufficient to cause pretty copious purging; or a few grains of calomel may be taken in the evening, and followed next morning by a dose of castor-oil, or of senna infusion. In the more chronic form of the disease, active purgation is not in general beneficial. The bowels should be kept in a loose state, however, by small doses of rhubarb or castor oil, or some other mild laxative. In many cases, there is considerable gastric disorder, the appetite being variable and capricious—sometimes much depressed, and at others voracious. Where this is the case, *emetics* may be accounted among our most useful remedies. An aqueous solution of tartar emetic appears to be the best article for this purpose. The emetic may be repeated every third or fourth day, during the active state of the inflammation.

To promote the regular performance of the various excretory functions, small doses of calomel with pulvis antimonialis should be given at night, and where the system is very irritable, it will be proper to add a few grains of Dover's powder.† In a few instances I have derived conspicuous benefit from the use of sarsaparilla syrup, with a very minute portion of muriate of mercury, but in many instances it failed entirely in doing any good. Where there is considerable general irritation, a solution of tartar emetic, given every two or three hours, in doses just suffi-

* Transact. Med-Chirurg. Society of Edinb. Vol ii.

† ℞. Calomel gr. iv.
Pulv. antimon.
—— Doveri āā gr. viii. M. Divide into four equal parts.

cient to cause a slight nauseating impression on the stomach, will sometimes prove serviceable. In recent and acute cases, the diet should be simple and unirritating; such as liquid farinaceous preparations, or thin animal broths; but in the more chronic variety of the disease, where the system is irritable and feeble, a more nourishing, though plain and digestible diet, must be allowed, in order to support the vigour of the system. Besides the general remedies already mentioned, various other articles have been recommended for the treatment of this affection; amongst which the muriate of *barytes*, and *iodine*, are the most important. Hufeland, in a small monograph on the use of the former of these articles in scrofula, relates some interesting examples of this variety of ophthalmia, which yielded to its powers.* I have employed this remedy in several cases with manifest advantage, and it appears to be worthy of more attention than it has of late years received. The best mode of exhibiting this substance is in solution. A half a drachm of the muriate should be dissolved in an ounce of distilled water; of this solution, from thirty to sixty drops may be given three or four times daily to an adult; and for children, from one to two years old, the dose is from ten to twenty drops. Hufeland says, that the best vehicle for administering this remedy, is a ptisan prepared of lig. guaiac., rad. gramin., sarsaparilla, and dulcamara. I have also prescribed the iodine in a few cases, and its use was continued for more than three months, without having in a single instance obtained any perceptible advantage from it. Nevertheless, no inconsiderable number of cases have been reported in which this article is alleged to have proved decidedly beneficial, and from its well-known influence over strumous glandular enlargements, it is certainly entitled to attention as a remedy in the present affection. Dr. Mackenzie, of Glasgow, speaks in the most favourable terms of the employment of the sulphate of quina in strumous ophthalmia. "After many years experience," he says, "in the treatment of strumous ophthalmia, and a trial of numerous and various internal remedies, I have found none so useful as *quina*. In most instances its effects have been very remarkable; and, indeed, although I have met with a few cases which appeared to resist its beneficial influence, in most of the little patients to whom I have administered it, it acted like a charm. The dose which I employ is generally one grain thrice a day; and in very young children, half a grain; and in adults two grains."† The Peruvian bark was strongly recommended

* Darstellung der Medicinischen Kräfte, der Salzsauren Schwererde. Von Dr. Christ. W. Hufeland. Berlin, 1794.

† On the Utility of Sulphate of Quina in Strumous Ophthalmia, with Cases. By Wm. Mackenzie, one of the Surgeons of the Glasgow Eye Infirmary.—*Glasgow Med. Journal*, No. i.

by Fothergill and Fordyce* in the treatment of this affection, but its powers are vastly inferior, in this respect, to the sulphate of quinine. (Mackenzie.)

With regard to the employment of collyria, and other local applications, little of permanent advantage is to be derived from them. As palliatives, however, slightly astringent lotions, such as weak solutions of nitrat. argent., sulph. zinc., or sulphat. cupri., may be beneficially used where the inflammation and pain is considerable; or a decoction of white poppy heads, "with a considerable quantity of extract of conium dissolved in it, (half an ounce to a quart of the decoction,) applied to the eye five or six times daily."† I have found a solution of the nitrate of silver, in the proportion of four grains to the ounce of distilled water, to answer better than any other application of this kind. A few drops of this solution is to be instilled into the eye once or twice daily. Mackenzie speaks well of a collyrium composed of one grain of *muriat. hydrarg.* dissolved in eight ounces of water. When the disease is chiefly confined to the tarsi, (ophthalmia tarsi,) benefit may be obtained from the application of red precipitate ointment, (fifteen grains to an ounce of lard,) to the edges of the lids. Mr. Jeffries observes, that the small pustules which occur on the cornea and conjunctiva, should by no means be opened by art, as they are then apt to degenerate into ulcers, an occurrence which always greatly aggravates the pain, inflammation, and intolerance of light, and increases the risk of ultimate loss of vision from destruction or opacity of the cornea.

Blisters very seldom procure any advantage in strumous ophthalmia. Indeed they often do harm, by the pustular inflammation which is apt to occur around the blistered part, and the consequent additional source of general and local irritation, which is thus created. The insertion of a *seton* in the back of the neck, is much more useful than vesication in such cases. After the acute character of the disease has subsided, the establishment of such a drain will almost always produce the most favourable effects. In four cases which had resisted for many months the ordinary remedies, the disease gradually disappeared entirely under the influence of a seton in the nape of the neck.

5. *Syphilitic and Strumous Iritis.*

Inflammation of the iris may be produced by various causes, but its occurrence from syphilis is incomparably the most frequent.

* Lond. Medical Observations and Inquiries, vol. i.
† Med. Chir. Rev. Dec. 1822, p. 538.

A vascular zone around the margin of the cornea, attended with cloudiness of the humours; constriction or very limited and sluggish motion of the pupil; intolerance of light; obscure vision; a continued deep-seated aching pain in the globe of the eye, forehead, and circumorbital parts; and the appearance of very fine red lines and specks upon the iris, are the principal phenomena characteristic of this variety of ophthalmia. In the progress of the disease, adhesion takes place between the fibres of the iris, "the pupil losing its thin flowing edge, and becoming thick, stunted, and gibbous." In slight cases, no other appearance of inflammation occurs in the eye, the conjunctiva remaining free from redness. In the more acute instances, however, the sclerotica is usually of a rose-red colour, shading off gradually towards the circumference. The pain, in instances of this kind, is often fitful, and is particularly severe in the evening or early in the morning. The usual sensation, however, (except during these evening or morning exacerbations,) is a feeling of constant painful pressure in the globe of the eye, with more or less of an aching pain in the temples, bone of the cheek, and forehead. In some instances, the pain in the eye is pulsatile, "marking every injection of the ophthalmic artery." In very acute and violent cases of iritis, lymph is deposited on the iris, appearing in small yellowish-red elevations on its surface; the pupil usually becoming angular and misshapen, and sometimes entirely blocked up by a layer of lymph.

Mr. Travers divides iritis into *primary* and *secondary*. The primary variety is commonly the consequence of syphilis, or of cold while the system is under the influence of mercury, and is distinguished from the secondary variety by "the more sparing vascularity of the conjunctiva, and the consequent more distinct appearance of the vascular corona round the cornea." It usually comes on rather suddenly; is attended with very severe pain in the orbit and head almost as soon as it commences; and "the vision is more quickly and completely dimmed. In the *secondary* form the inflammation gradually extends from the contiguous tunics to the iris; the conjunctiva is vascular and often rose-red; the cornea much clouded; the pupil retains its natural shape, or is but slightly deformed; the pain is confined in a great measure to the eye-ball, and is not often very severe, but the intolerance of light is generally very considerable." (Travers.)

When the disease is violent, and continues unchecked in its course, the iris projects forwards, and uniting with the cornea, produces corneal staphyloma. If the inflammation extends to the choroid membrane, retina, and vitreous humour, vision will inevitably be lost.

Strumous iritis, is most apt to occur in children between the ages of six and eighteen, of a delicate habit, "fair complexion,

light hair and blue eyes." The cornea acquires a misty appearance, with patches of red vessels usually appearing on its edges. A zone of pink vessels is formed around the cornea in various situations. Profuse lacrymation occurs, with distressing intolerance of light. The iris is nearly inactive, and vision is obscure. "The eye-brow appears to project considerably before the eye; the muscles (if one eye only be affected) become thicker and stronger than those of the opposite side, from their powerful contraction to exclude the light, and give to the countenance a distorted appearance. The pulse is generally quick and irritable; the appetite uncertain; the secretions unhealthy; the skin dry and harsh, but variable in temperature; the heat of the scalp being oppressively great, whilst the extremities are often chilled with cold."

Treatment.—Although mercury may be regarded as the principal remedy in this variety of ophthalmic inflammation, yet, general and local depletory measures, free purgation with calomel and jalap, and nauseating doses of antimonials, are essential auxiliaries in the acute stage of the disease. Without mercury, little or nothing can be effected towards arresting the progress of the inflammation. It should be given to the extent of producing ptyalism, except in subjects of a debilitated and worn down constitution, where a more moderate mercurial action should be established, and the system supported by a nourishing but unirritating diet. Great care must be had to avoid taking cold while under the mercurial influence in this affection. Mr. Middlemore, assistant surgeon of the Birmingham Eye Infirmary, has published a statement which would seem to show that much advantage may be obtained from the use of the spirits of turpentine in this affection.* Mr. Carmichael and Mr. Gutherie, have also given reports illustrative of the usefulness of this remedy. Mr. Middlemore asserts that he gave it with advantage to patients, who from delicacy or constitutional idiosyncrasy were unable to use mercury to the extent of producing salivation. Where the acute symptoms had been relieved by mercury, the turpentine, given in drachm doses, two or three times daily, manifested a peculiarly excellent effect. He insists strongly on the early employment of this remedy in inflammation of the choroid and retina.

Strumous iritis is extremely obstinate in its duration. In delicate children very small doses of calomel with prepared chalk, may be given every evening, and a grain of quinine twice during the day. The quinine will often do more good in cases of this kind than any other remedy we possess. A seton in the nape of the neck, or a small issue on the arm, will in general con-

* Medico-Chirurg. Rev. July, 1830.

tribute considerably to the reduction of the inflammation. Suitable clothing to keep up the regular warmth and action of the skin is an important auxiliary. The patient should also be allowed moderate exercise in the open air; and a simple digestible and nourishing diet is to be enjoined.

CHAPTER XVI.

OF THE CUTANEOUS PHLEGMASIÆ.

Exanthemata.

The term *exanthemata* is derived from the Greek word ἐξανθεω, effloresco; and is employed to designate those acute *contagious* affections, in which an efflorescence or eruption appears on the surface of the body. The exanthematous fevers are of a strictly *specific* character:—that is, each affection of this kind has its specific cause, and cannot, so far as we know, be produced by any other cause or combination of causes. In all of them, fever exists as the primary or essential disease—the eruption being a secondary affection, and the immediate consequence of the specific febrile excitement. Unless interrupted by constitutional idiosyncrasy, or adventitious influences, each of these diseases has its determined course, both in relation to the duration of its stages and the succession of its characteristic phenomena. They are all communicated by contagion; and they possess the power of destroying the susceptibility of the human organization, to the subsequent morbific influence of their respective contagions, although instances do occasionally occur in which this power is more or less effectively opposed by the system, and in which, therefore, a second attack is possible.

Sect. I.—*Variola.—Small-Pox.*

It is not known at what period the small-pox made its first appearance. In the writings of the Greek and Roman physicians, we find nothing which could lead us to believe that they had any particular knowledge of this devastating malady, although we can scarcely doubt that its origin was of a much earlier date.*

* Rhazes, indeed, refers to some expressions in the writings of Galen, which would seem to show that small-pox, though not described, was known by this

The Arabian physicians were the first who gave a distinct description of this disease; and it is to the small work of Rhazes, who lived about the beginning of the tenth century, that we must look for an account of its early history. It may be collected from the writings of Rhazes and others, that small-pox was probably at first brought from Ethiopia into Arabia, and that it was thence conveyed into the Levant, Spain, and Sicily, by the Saracens, during their hostile irruptions into these countries.* In the eleventh and twelfth centuries, it gained vast ground during the wars waged by the Christian potentates against the infidel Saracens, for the recovery of the holy land. From that time forwards, its desolating visitations were frequently renewed in every part of Europe, and there is perhaps no single disease, with which the ALMIGHTY has thought it good to afflict mankind, which has carried off so many victims to the grave as the present one.†

Small-pox is divided into two varieties—namely, the *distinct* and *confluent*. In the former, distinct, elevated, distended, and circular pustules are scattered over the surface of the body; and in the latter the pustules are exceedingly numerous, depressed, irregularly circumscribed, and confluent or coherent. There exists, however, no essential difference between these varieties; and the division is indeed altogether arbitrary, for in some instances the pustules are confluent on the face, while on the rest of the body they are distinct.

The time which elapses between the reception of the variolous

Roman writer. "As to those physicians," says Rhazes, "who affirm that the most excellent Galen has made no mention of the small-pox, and therefore that he did not know this distemper; surely they have either never read his works at all, or only very cursorily; nay, most of them do not know, whether what he plainly says of it is to be understood of that disease. For Galen, in a certain treatise, says: *this * * * does good against the small-pox.* And in the beginning of the fourteenth book of *pulses*, he says, that *the blood is putrefied in an extraordinary degree, and that the inflammation runs so high that it burns the skin; so that small-pox and pestilent carbuncle are bred by it.* And in the ninth treatise of the book *Of the Uses of the Parts*, he observes, *that the superfluous parts of aliments which are not turned into blood, and remain in the members, putrefy, and in time increasing, do ferment; whence, at last, are generated the pestilential carbuncle, the small-pox, and confluent inflammations.* Lastly, in the fourth part of his commentary upon the *Timæus* of Plato, he says, that the ancients gave the name of φλεγμονὴ to every thing which produces redness, as the carbuncle and *small-pox.*"—*Treatise on the Small-Pox and Measles.* By Abubecker Rhazes, chap. i. Translated by Thomas Stack, M. D., F. R. S.

* It would appear, that small-pox was known in Europe as early as the seventh century. The word *variolæ* occurs repeatedly, in some manuscripts discovered by Dr. Woodville, in the British Museum, and in the Cottonian collections, written about the close of the eighth century; and Marius Aventicensis, bishop of Lausanne, in the seventh century, uses these words: *Hoc anno variolæ cum profluvio ventris, Galliam, Italiamque valde affixit.*—*Gregory's Practice*, vol. i. p. 197.

† It has been estimated, that before the introduction of vaccination, 450,000 individuals died annually of small-pox in Europe.—*Richter's Therapie*, b. ii. p. 302.

virus, and the first manifestations of its influence on the system, is said to vary from about seven to twenty days; although by far the most common period of its inception is between the ninth and fourteenth days. During this period of *incubation*, no obvious symptoms of indisposition occur—the individual retaining an apparently good state of health. It is stated by some, that the disease is apt to be most violent when this period is of short duration.

Course and symptoms of the distinct variety.—The disease commences with a feeling of languor, weariness, aching pains in the back and lower extremities, slight creeping chills, with flushes of heat and pain in the forehead. More or less nausea and vomiting, attended with great thirst, *pain in the epigastrium*, and some degree of soreness in the fauces, speedily ensue. When the fever is completely developed, the skin and face are dry, the tongue white and generally red at the point, the bowels torpid, and the urine scanty and of a deep red colour. During the first and second days of the fever, slight hæmorrhages from the nose are apt to occur; the mind often becomes dejected and confused, and towards the end of the third day, the tongue usually acquires a bright red colour. Shortly before the appearance of the eruption, an unusual tendency to perspiration generally occurs in adults, and frequently much drowsiness, and sometimes coma, supervene at this period. In children the eruption is sometimes preceded by convulsions; but the tendency to free perspiration very rarely occurs in them. In many cases, the hands and feet are cold throughout the whole course of the disease, more especially in very young children. The coldness of the extremities has by some been considered as the most certain diagnostic symptom of the eruptive variolous fever; but the most frequent and characteristic phenomenon of this fever is the pain and soreness to pressure of the epigastrium, and the vomiting. (Philip. *Febrile Diseases.*) Both in adults and in children, a considerable increase of the febrile symptoms usually takes place a short time before the eruption begins to appear; and in some instances severe cramps in the legs occur at this period.

Towards the end of the third, or the beginning of the fourth day from the commencement of the disease, the *eruption* begins to make its appearance. The pustules appear first on the forehead, and on the parts about the mouth and nose—next on the fore-arms and upon the breast and abdomen—and last of all on the lower extremities; so that in about twenty-four hours the eruption is completed. The eruption consists at first of red points, which by the middle of the second day present small elevations, with inflamed bases, which as yet discharge no serous fluid when punctured, but "the cuticle appears distended by a sort of semi-transparent plastic lymph." Towards the end of the second day,

some of these pustules present central depressions ; and on the following day this characteristic depression becomes conspicuous in nearly all of them. Where there are but few pustules, they often remain elevated and pointed, with but a very slight central depression ; but where they are numerous, they assume an umbilicated form, or flattened with a distinct depression in the centre. The fluid appears at first in the central points, and is of a limpid and serous character. The pustules continue gradually to increase in size, at the same time that their umbilicated form becomes more and more conspicuous. About the fourth day they assume a whitish colour, and become surrounded by a pale red areola. When the pustules are very numerous, these areolæ run into each other, and give a uniform appearance of redness to the interstitial spaces. The limpid fluid which appears at first in the central part of the pustules, gradually becomes more and more abundant—extends towards the basis of the pustule—and changes from its serous to a purulent character. This change occurs between the fifth and seventh day, and marks the commencement of the stage of

Suppuration.—In the *distinct* variety, the fever which precedes and accompanies the eruption always remits greatly, and frequently disappears entirely, as soon as the eruption is completed. When suppuration commences, however, the febrile symptoms usually re-appear. As the process of suppuration goes on, the pustules become distended with pus, and, losing the flattened form, acquire a spherical shape. About the eighth day, when the crop of pustules is pretty numerous, the face begins to swell ; the upper eye-lids sometimes becoming so tumid and puffy as to close the eyes entirely. Towards the end of the tenth day the swelling of the face begins to subside, but instead of this, considerable tumefaction occurs in the hands and feet, and the interstitial spaces over the whole body become more or less swollen, tense, and sore. The period of suppuration is almost invariably attended with soreness in the fauces, and where the pustules are numerous, with a copious secretion of viscid saliva. In some instances, the increased flow of saliva occurs with the commencement of the eruption, but its usual time of occurrence is after the suppurative stage has supervened. This secretion generally becomes so thick and viscid, that it is spit out with considerable difficulty, and renders swallowing difficult. On examining the mouth and fauces, they are found swollen and of a bright redness ; and from the eustachian tubes becoming closed by the tumefaction, more or less obtuseness of hearing usually occurs. During the latter period of the suppurative stage, a strong and very peculiar odour rises from the patient's body, and this exhalation continues until the process of desiccation is completed. When the tumefaction of the face is

very considerable, more or less drowsiness or oppression often occurs, and in some instances diarrhœa supervenes towards the completion of the suppurative process. The *secondary* or suppurative fever varies in violence and duration, according to the copiousness of the eruption, and the activity of the suppuration. In mild cases of the distinct variety of the disease, the secondary fever rarely continues longer than two or three days, and is seldom attended with symptoms of severity. The suppuration, like the appearance of the eruption generally, begins on the face, and lastly on the hands and feet. As the disease advances, the pustules gradually become yellower and more opaque, and arrive at their full state of maturity about the twelfth day.* After the pustules have acquired their perfect state of development, they sometimes remain stationary for several days; but more commonly a brownish spot makes its appearance on the centre of each pustule as soon as the process of suppuration is completed, acquiring at the same time a rougher and deeper yellow aspect. Soon after the occurrence of this change, the pustules begin to shrink, becoming gradually drier, browner, and harder, until the matter is converted into a brown crust. *Desiccation* always commences on the face, "this part being often covered with scabs, when the pustules on the extremities have scarcely arrived at maturity." When the scabs fall off, they leave a vividly red surface, which disappears very gradually. In mild cases of distinct small-pox, the suppuration seldom destroys the skin and subcutaneous cellular tissue, and the skin therefore does not become pitted or marked. In the more severe instances of this variety, however, the cicatrices remain with more or less distinctness—becoming more and more visible, as the redness, which remains after the falling off of the scabs, gradually disappears.

Confluent small-pox.—The pain in the back and extremities during the eruptive fever, is almost always much more severe in the *confluent* than in the distinct variety of the disease; and, in general, all the febrile phenomena are usually more violent in the former than in the latter. The heat of the skin is very great; the thirst exceedingly urgent; the tongue dry, harsh, and sometimes covered with a dark-brown or blackish fur, and the nervous system is often much affected. In the distinct variety, the eruptive fever is almost invariably of the synochus or synocha grade. In the more aggravated instances of *confluent* small-pox, it often assumes a typhous character;

* If a mature pustule be opened, which had previously presented a well-marked central depression, a yellowish pus will be found below, presenting a small, white, umbilicated disk, perfectly resembling in form and size, the pustule before the pus had altered its shape.—*Cazenave. Practical Synopsis of Cutaneous Diseases*, p. 142.

although in the majority of cases, the *eruptive* fever is highly synochal. The tendency to copious perspiration, often so conspicuous in the distinct small-pox, is rarely observed in the confluent variety; but profuse diarrhœa sometimes occurs just before the appearance of the eruption, and still more commonly during the suppuration. It has been observed, that the secretion of saliva, commonly so abundant in this affection, is usually very trifling, or almost entirely suppressed when diarrhœa attends.

In general, the eruption appears at an earlier period in the confluent than in the distinct variety of the disease; and the time of its appearance is altogether much more irregular in the former than in the latter. In some instances, the pustules come out as early as the second day, and, occasionally, not until the fourth or fifth day after the commencement of the fever. In many instances of confluent small-pox, a roseolous rash or efflorescence precedes the variolous eruption—a phenomenon which is occasionally observed also in the distinct variety. When the eruption is confluent, the small red papular points which appear at first, run into each other, and form "a large red, tumefied, and somewhat rugose surface." The patient at the same time is very drowsy, and the carotids beat strongly. The pustules of *confluent* small-pox are commonly irregular in shape, and much less elevated than in the distinct small-pox; and the parts not covered with the eruption are pale and flaccid. The central depression is generally inconspicuous; and about the third day the pustulated surface of the face becomes "covered with a kind of subcuticular whitish pellicle." The tumefaction of the face and hands, as well as the soreness in the fauces and the flow of saliva, are generally very great in the confluent variety. The reverse, however, is occasionally observed; for, in some instances of *confluent* small-pox, these symptoms are but very slight. When the suppuration is completed, a very manifest aggravation of the febrile symptoms occurs, constituting what is termed the *suppurative* or secondary fever. The matter in the confluent pustules is of a whitish-brown and sometimes of a dark colour, and of much less consistence than in the mild form of the disease; and in some instances, it acquires a corrosive character. About the eighth or ninth day of the eruption, the matter begins to escape from the pustules, and hardens on the surface into extensive brown crusts, which fall off at periods varying from the fifth to the fifteenth day from their formation, and are succeeded by desquamations which finally leave deep marks or pits, which are often so united as to form "seams that traverse the face in all directions." Both in the distinct and confluent varieties of the disease, great itching attends the period of desiccation.

The eruption of small-pox is not confined to the external surface of the body. The pustules occur also on the mucous mem-

brane of the mouth, larynx, and trachea, and on the tongue—giving rise to more or less copious ptyalism, hoarseness, painful swallowing, difficulty of breathing, cough, viscid expectoration, and perhaps diarrhœa.

The disease is sometimes, from the commencement, of a highly inflammatory character. It begins with strong chills, succeeded by intense febrile heat; a frequent, full, and hard pulse; high-coloured and scanty urine; flushed countenance; sometimes delirium; and, in children, often convulsions. Internal inflammations, particularly of the brain or lungs, are apt to supervene in cases of this kind. When the former organ becomes the seat of the inflammation, violent delirium, coma, convulsions, or apoplexy ensue. Thoracic inflammation is indicated by the occurrence of pneumonia, pleuritis, or effusion into the lungs. The eyes, too, are apt to become inflamed, and the parts not covered with pustules are vividly red and much tumefied.

In some instances the attending fever, even in the distinct variety of the disease, is typhoid. The chilly stage is unusually protracted; the pulse remains small, weak, and frequent, and the patient complains of much muscular prostration. Various symptoms of nervous disturbance are apt to occur—such as vertigo, faintness, twitching of the tendons, and even convulsions. The urine is colourless and the face pale and sunken. The pustules come out slowly and irregularly, appearing simultaneously on every part of the body, and sometimes first on the extremities, and are often congregated in irregular clusters. The eruption sometimes disappears on some parts without passing into the pustular state; and slight causes, such as cold or mental agitation, may even occasion the whole eruption to recede; in which case, convulsions, or apoplexy, or fatal congestion and effusion into the lungs are apt to supervene. Suppuration goes on slowly and often imperfectly, the pustules becoming filled with a thin watery pus. The intermediate skin is seldom much tumefied, and remains pale. In the advanced period of the disease, the swelling of the face and extremities sometimes subsides suddenly, and the patient dies apoplectic. *Desiccation* generally commences several days earlier than in the ordinary course of the disease; and at this period the fever is apt to become much aggravated.*

The disease sometimes manifests a highly malignant or putrid character—more especially the confluent variety. The heat is acrid (calor mordax;) the perspiration clammy and offensive; watery diarrhœa often occurs; the face is bloated and red; the eyes watery and inflamed; the appearance of the eruption and its progress are irregular. The pustules commonly acquire a

* Richter's Specielle Therapie, b. ii. p. 297.

dark or livid hue; are surrounded with brown or almost black margins; and become filled with a bloody serum instead of pus. Colliquative hæmorrhages, particularly from the nose, are common. Desiccation leaves very dark or black crusts, beneath which phagedenic ulcerations are not unfrequently formed.*

When the small-pox attacks females in the state of pregnancy, it frequently gives rise to abortion, more especially during the early periods of utero-gestation.

Such are the usual course and phenomena of the distinct and confluent varieties of small-pox. It is subject, however, to considerable irregularity, both in relation to its general progress and the character of its particular symptoms. But the most remarkable variety of anomalous small-pox is that which has been termed the *chrystalline*, and in which, instead of pustules containing purulent matter, the eruption consists of phlyctenæ, or vesicles filled with a colourless transparent serum. The phlyctenæ soon become pale, and although not confluent, are never surrounded by inflamed margins. This variety of the disease is of a most dangerous character. In many instances, no tumefaction of the face or hands occurs, a circumstance which is particularly indicative of great violence and danger; "for, instead of these swellings, the inflammation generally seizes on the brain." The secondary fever in this variety of the disease usually assumes an evident typhoid character.

The sequelæ of small-pox are very various, and often extremely distressing. The disease may give rise to slow and wasting fever, dropsy, chronic cutaneous affections, phagedenic ulcerations, necrosis, chronic ophthalmia, rheumatic pains, deafness, paralysis, struma, phthisis pulmonalis, mania, epilepsy, opacity of the cornea, staphyloma, dropsy of the eye, and cataract. The small-pox is sometimes remarkably modified by the influence of the contagion of measles. Sydenham observes, that in 1670–71–72, the small-pox and measles prevailed at the same time in London, and that, during this period, the variolous affection assumed an extremely irregular and violent character. The eruption, at first, resembled measles or erysipelas; in its progress, small vesicles filled with a colourless fluid appeared among the variolous pustules. The scabs formed on the pustules resembled concreted blood, and at last became almost black.

The influence of measles on the progress of small-pox, when the two diseases meet in the same individual, is equally remarkable. It has been frequently noticed, that the supervention of measles during the early periods of small-pox, causes this latter disease to remain nearly stationary until the morbilious affection has run its course, when the small-pox resume their progress and

* Richter's Specielle Therapie, b. ii. p. 299.

proceed to their regular termination. Thus, if on the second day of the small-pox eruption, the measles make their appearance, the small-pox will remain stationary until the measles have gone off, after which, the variolous disease will resume its dominion and go on in the usual way.

Post mortem appearances.—The morbid appearances on dissection vary, of course, considerably, according to the stage of the disease during which death takes place, the violence of the particular symptoms, and the accidental affections with which it may be complicated. Sanguineous congestions in the brain and lungs are generally strongly manifested. Pustules are not unfrequently found in the larynx, trachea, and bronchia, as far as the third division. In the pharynx too, the variolous pustules are sometimes pretty numerous, but they are very rarely found in the œsophagus. Traces of inflammation to a greater or less extent are almost invariably detected in the mucous membrane of the alimentary canal, and pustules of a variolous character are sometimes met with in the lower portion of the rectum. It is observed by Cazenave and Schedel, that they had never in any of their dissections found the pustules on the mucous membranes distended with pus. It does not appear from the observations of those who have paid particular attention to the post mortem appearances in this disease, that the variolous pustules are ever found on the viscera or in the closed cavities of the body. Some late writers assert, that the internal surface of the aorta almost constantly presents a vividly red appearance, but the frequency of this appearance is denied by Cazenave and Schedel.

The pustules on the skin, when anatomically examined before they are distended with pus, or before they have lost their umbilical form, present the following appearances:

1st. "The cuticle preserves its natural thickness, and is easily detached, leaving exposed a whitish and smooth surface, elevated at the edges and depressed in the centre.

2d. "A small umbilicated disk of various thickness, formed by a whitish substance, having a certain consistency, and which appears to be a real exudation from the inflamed dermis. This substance occupies the place of the mucous coat, and at first appears to be continuous with the layer which is immediately under the epidermis, but afterwards is easily separated from it. This small body adheres to the dermis by its centre, where it is also much thinner, and often tears when it is attempted to be raised." If, when the cuticle is elevated by the pus, the pustule be examined with care, it will be found that the bottom of the pustule still presents the same umbilicated form that it possessed before the cuticle was raised and distended by the purulent fluid.

3d. "Finally, below this small disk, the dermis is of a red colour, and sometimes covered with purulent fluid."*

The true seat of the small-pox pustule appears to be in the reticular tissue which lies between the cutis vera and the cuticle. In its early stage, the pustule, when examined with a lens, exhibits a cellular structure, and from the sixth to the ninth day, a thin circular slough of the true skin may be observed at the bottom, which, on being finally cast off, gives rise to a depression or pit in the skin.

Cause.—Small-pox, so far as we know, can arise only from one cause—namely, a peculiar contagious substance, which occurs both under the form of a palpable matter and of an imperceptible effluvium, but of whose intimate nature and origin we are entirely ignorant. Observation has made us acquainted, however, with its obvious relations as a morbific agent, and with some of the influences, both vital and extraneous, which tend to modify its operation on the human system. It does not appear that age or sex exerts any controlling power over this contagion, and we know that even the fœtus in the womb is not exempt from its morbific effects. Nor does climate or season, so far as the sensible atmospheric conditions are concerned, appear to exercise any influence either in retarding or favouring its dissemination. One of the most remarkable and mysterious phenomena of this, as well as of other epidemic contagious diseases, is its recurrence at distant intervals in an epidemic form, depending, no doubt, on certain occult atmospheric constitutions peculiarly favourable to the operation of the variolous contagion. The disease occurs, indeed, also sporadically ; but during certain periods, its contagion may thus here and there manifest its presence, without passing from individual to individual, and be speedily extinguished, like sparks thrown among incombustible materials. What these atmospheric conditions consist in, if in truth the phenomenon in question depend on atmospheric modifications, we know not. Whatever may be the general cause to which these influences belong, it is probable, that its effects are exerted rather upon the human constitution, by which its susceptibility to the operation of the variolous virus is either increased or diminished, than in modifying the activity of the contagious principle itself.

The susceptibility to the operation of the small-pox contagion varies much in different individuals, not only in relation to the liability of becoming affected by it, but also to the degree of violence which the disease, arising from the same source of contagion, assumes. Thus, some persons, (though indeed very few) appear to be naturally insusceptible of the disease ; others are affected,

* Cazenave, loc. cit.

even by inoculation, with great difficulty ; and among a number of individuals exposed to the same contagion, the disease will assume a confluent form in some ; in others it will be severe but distinct ; in a third, mild and distinct ; and in others, again, it will be very mild, and scarcely attended with any eruption. These diversities in the effects of the contagion must be ascribed to original idiosyncrasy, temperament, and to accidental modifications or conditions of the organization. One thing is well ascertained in relation to this point—namely, that whatever tends to reduce the general vigour and phlogistic habit of the system, tends also to lessen the violence of the variolous affection ; and it is to this circumstance that we owe all the peculiar advantages which are derived from inoculation. The variolous contagion possesses the power of destroying the susceptibility of the system to its subsequent operation, so that a second attack of perfect small-pox in the same individual, though an occasional, is far from being a common occurrence. Instances of a second, and even a greater number of attacks in the same person, have indeed been frequently noticed ; and when we take into account those incomplete cases which are termed *varioloid*, secondary attacks of the disease may be considered as very frequent.

Prognosis.—Small-pox varies exceedingly in relation to its violence and the degree of its dangerousness. The *distinct* and simple form is by no means a dangerous affection ; whilst the *confluent* variety is always attended with great hazard to life. In the more violent cases of the disease, death sometimes takes place as early as the fifth or sixth day ; but the greatest fatality occurs during the stages of suppuration and desiccation. The prognosis depends chiefly on the quantity of the eruption ; the character of the pustules ; the nature of the attending fever ; and on the accidental morbid complications.

However regular the progress of the disease may be, the danger is always great when the pustules are very numerous, more especially when they are confluent. It would seem from estimates that have been made in relation to the mortality from small-pox, that nearly three out of five instances die in the confluent variety.

The check which a very copious crop of pustules must necessarily give to the cutaneous exhalation, and more especially the great irritation caused by so extensive a surface of suppuration, and perhaps the absorption of the pus itself, are the principal causes of the fatal character of the confluent variety of the disease. In relation to the form and appearance of the pustules, it may be observed, that the more elevated they are, the more distinctly they are surrounded with red areolæ; and the more regularly they become filled with a thick yellowish pus, the more favourable is the prognosis. When, on the con-

trary, the pustules are flat or depressed, coherent, or congregated in clusters, warty, empty, or filled with a colourless watery fluid, it is a very unfavourable sign. It is a still worse indication when the pustules become filled with blood.* With regard to the character of the attending fever, the more decidedly phlogistic or typhoid it is, the more danger is there to be apprehended. A *moderately* active state of fever is favourable, but a tendency to a low grade of reaction is the reverse. Richter observes, that when the disease is complicated with prominent catarrhal symptoms; or with difficult dentition; or intestinal irritation from worms; much danger may be apprehended. In general, the prognosis is unfavourable when the disease occurs in old persons of enfeebled constitutions; in plethoric, robust, and vigorous adults; and in very young infants. Pregnancy, or the puerperal condition, also tends to increase the dangerousness of the disease. It has been observed, that the period of life most favourable to a mild and regular course of the disease, is between the third and the tenth year of age. The age of puberty in *females*, is said to be a particularly dangerous period in relation to this complaint.† Convulsions just before the appearance of the eruption, are rarely attended with any serious consequences; but when they occur during the period of suppuration, the danger is always extremely great.

Suppression of the urine, or a very frequent desire to void it, is said to be a very unfavourable sign, when it occurs during the suppurative stage. It is also a particularly dangerous sign, when the pustules, about the sixth or seventh day of the stage of suppuration, become collapsed, and the swelling of the face suddenly subsides, at the same time that the areolæ disappear, and the intermediate skin becomes pale and flaccid. The sudden recession of the eruption, soon after its appearance, is always very dangerous. Of course, the supervention of visceral inflammation, or of sudden violent congestions of blood in the brain and lungs, are occurrences of the most alarming character.

Treatment.—There is, perhaps, no disease in which false theory has led to such fatal consequences in practice, as small-pox. During the general prevalence of the doctrine of morbid humours, it was supposed that the variolous matter was formed by a species of fermentation in the blood, and that the more perfectly this matter was separated and cast upon the skin, the greater would be the chance of recovery. Great efforts were accordingly made to assist nature in establishing as copious a crop of pustules as possible; and under this fatal delusion, all kinds of heating medicines and external warmth were diligently

* Richter, loc. cit. p. 303.
† Ibid.

applied. When we reflect on the inevitable result of this practice, so long and so universally pursued, we see in it a frightful drawback on the amount of benefit conferred by the healing art in relation to this disease, although this amount must be regarded as immense, from the introduction of inoculation, and especially of vaccination. Among the moderns, Sydenham appears to have been the first who saw the fatal tendency of the heating or exciting plan of treatment in small-pox. He revived the cooling or antiphlogistic treatment of the Arabian physicians,* a mode of management which is now universally acknowledged as the only practice capable of mitigating the violence and dangerous character of the malady.

Instead, therefore, of supporting the excitement during the eruptive fever, that the eruption may be copious, we must endeavour to moderate the febrile reaction, that the pustules may be as few as possible. By an early attention to the fulfilment of this object, the disease will often pursue a mild and simple course, whilst under the employment of exciting remedies, it would, in

* The general plan of treatment laid down by Rhazes, differs in no essential point from that which was recommended by Sydenham. For the purpose of diminishing the violence of the disease in those who are exposed to the small-pox contagion, Rhazes advises, that "a vein be opened in those who are fourteen years old. To those who are younger, cupping-glasses must be applied, and their lodgings should be kept cool." The diet, he says, must "consist of yellow lentils, tarts of unripe fruits," and their drink "should be water cooled with snow, or clear cold spring water, with which also their chamber may be sprinkled." They must frequently eat "acid pomegranates, and the inspissated juices of acid and astringent fruits." The patient must "go into cold water and swim in it, about noon. He must abstain from wine, and meats made by a mixture of flesh, onions, oil, butter, and cheese;" as well as from "mutton, beef, shell-fish, and high-seasoned things, and hot seeds; but, if his temperament be hot and dry, and apt to be inflamed, he must eat cooling and moist garden herbs, purslain, mallows, beets, gourds, cucumbers, sorrel, and small pompions. All acid things are proper to cool the blood and check the ebullition, especially the water called *Al-râib*, that is, the sour, bitter water, which swims upon butter-milk, exposed to the sun. When the variolous fever has supervened, care must be taken not to refrigerate too much, so as not to extinguish preternatural and natural heat together." Nevertheless, when, during the fever, "you observe great pain in the back, redness of the face and eyes, a violent headach, a full pulse, with a straitness of breath, a red and turbid urine, and such a heat of the body as a man feels who has been for some time in a hot bath; there is then all the reason in the world to take away blood, even till the patient faints away. But, if the symptoms do not run very high, although they are manifest, draw blood but sparingly. In order more perfectly to extinguish the feverish heat, let the patient drink water, made cold in snow, very plentifully; so that he may feel the coldness of it in his bowels. If still the heat return, and the belly be full of water, make him vomit it up, and then give it him again." During the eruption and suppuration, the patient "must be kept in a room *not very* cold; he should drink frequently, a little at a time, of *cold* water." "As to the furnaces and baths, they are both destructive, at this time, by over-heating and weakening." When the eruption goes on slowly and with difficulty, the cooling and extinguishing remedies "must be absolutely forborn." The drinks "must be warm."(*a*)

(*a*) Rhazes, loc. cit.

all probability, have assumed a confluent and highly dangerous character. It is upon the power which an antiphlogistic treatment exerts in moderating the violence of the disease, or of rendering the eruption scanty, that all the advantages of inoculation depend. When an individual is inoculated, the phlogistic state or tendency of his system is diminished by purgatives, simple and cooling diet, and, in plethoric subjects, by bleeding; in consequence of which, a less copious crop of pustules ensues, and the disease, in general, pursues a proportionately milder course.

Sydenham resorted to the lancet as the principal means for moderating the febrile excitement. There can be no doubt, indeed, that bleeding must often prove very beneficial; but, it seems to be admitted on all hands, that it cannot be employed with great freedom, without considerable risk of mischief, unless the reaction be very violent, or the general phlogistic condition great. "It is an observation universally applicable," says Dr. Philip, "that blood-letting is only to be recommended when the effects expected from it cannot be procured by other antiphlogistic remedies."

Cathartics of the *milder kind* are always highly useful during the eruptive fever, in cases requiring a reduction of the general excitement. Very *active* purging—more especially in mild cases, or when the appearance of the eruption is at hand—is improper, as it may readily interfere with the regular progress of the eruption, by the centripetal direction it tends to give to the circulation. Throughout the whole course of the disease, however, mild laxatives may be beneficially employed. These observations have a reference to the *distinct* variety of the disease; for in the more violent or *confluent* form, we may derive advantage from *active* purging during the eruptive fever. Calomel is one of the best purgatives in small-pox. Its operation is sufficiently mild, and it would seem, that it possesses peculiar powers in moderating the violence of the disease. (Mead, Boerhaave.) The neutral purgative salts, also answer well during the eruptive fever.

Some have recommended emetics in the commencement of the disease; and where there are signs of vitiated secretions in the stomach, they may no doubt be useful when early administered. When given about the seventh day of the confluent variety, they are said to have no inconsiderable influence in moderating the secondary fever; but in general, they are most useful when given in the onset of the complaint. (Philip.)

Diaphoretics of the refrigerant kind will assist in moderating the eruptive fever. Nitre, with small doses of tart. antimony; the saline effervescing draught; spiritus mindereri; sweet spirits of nitre with *vin. antim.*, a solution of muriate of ammonia, &c. may be used for this purpose.

But the most grateful, and at the same time the most safe and

valuable means for moderating the eruptive fever, and thereby lessening the number of pustules, is the *cooling regimen.* The free admission of cool air into the sick chamber during the eruptive fever, is in all cases, whether the disease be of the distinct or the confluent variety, of great importance; and it seldom indeed fails to mitigate the symptoms, in a greater or less degree, throughout the whole course of the disease. The patient should lie on a mattress, with light and cool coverings; and his drinks should consist of cool, acidulated beverages. The temperature of the sick chamber must of course be regulated according to the season of the year, and the degree of febrile excitement present. In warm weather, the external air must be more freely admitted than in cold seasons; and more reduction of temperature is necessary when the excitement runs high, than where it is of a low or feeble kind. There is but one form of small-pox in which the cooling regimen is said to be objectionable, namely, the *crystalline.* The air surrounding the patient ought to be kept uniformly at a temperature just low enough to give the sensation of *moderate* coolness. If the fever continues after the eruption is completed in the distinct variety of the disease, it will still be proper to go on with the cooling treatment, together with mild laxatives, diaphoretics, and antimonials.

It has already been stated that in the confluent variety of the disease, the fever often assumes a low typhoid character; and in instances of this kind, the diet, instead of being cooling and diluent, should be more or less exciting and supporting. Where the general excitement is low and sinking, it will even be necessary to resort to the more active stimulating and tonic remedies, such as wine, carbonate of ammonia, camphor, musk, &c. *Camphor* is a particularly valuable article in such cases where delirium attends. The Peruvian bark has also been very favourably mentioned as a remedy in such cases; and where the process of suppuration goes on tardily and imperfectly from want of general energy, large doses of this article, or of quinine, are indeed highly useful. Under similar circumstances—that is, where the pustules are slow in filling up, or the fluid in them remains watery,—opium in combination with camphor has been found a very useful remedy. (Philip.)

When during the progress of the disease, internal visceral inflammations supervene, local abstractions of blood from the external region of the affected part, blisters, scarifications, and, where the general arterial action is not too low, bleeding from the arm, must be resorted to. In instances attended with cerebral inflammation, much benefit may often be derived from flannel wrung out of hot water applied to the feet, at the same time that pounded ice is applied to the top of the head. The occurrence of profuse diarrhœa during the secondary fever of confluent

small-pox, must be counteracted by astringent and absorbent remedies. From eight to ten grains of prepared chalk, with a grain of *pulv. ipecac. compositus*, will generally answer our purpose in such cases. It is not, however, proper to arrest the discharge wholly in such cases. It should be *moderated* only. When violent and continued vomiting occur, we may resort to opium and camphor. One grain of the former with two of the latter may be given every hour or two, according to the violence of the symptoms.

To prevent the pustules from affecting the globe of the eye, and injuring the sight, pieces of folded linen wet with cold water should be kept applied to the eyes during the eruptive fever. The application of camphorated spirits has been used for this purpose; but cold water is more agreeable, and also most effectual in this respect.

The use of *lunar caustic*, as a local application to the pustules, has of late been recommended and successfully practised in France, for the purpose of lessening the number of pustules, and by so doing, rendering the disease milder and less dangerous. In 1825, M. Velpeau read a memoir before the Royal Academy of Medicine, of Paris, tending to prove, that if the pustules of small-pox are cauterized during the first two days with lunar caustic, their progress will be arrested. This practice was fully tested some time after, by Dr. Meyreux. According to his report, it appears, that if the variolous pustules are opened with a lancet, and touched with a pointed piece of lunar caustic, *on the first or second day* of their appearance, they will be wholly destroyed, and leave no marks; but on the *third day* it will be quite useless.

When soon after the eruption has appeared, it is again driven in, (an occurrence which may proceed from the sudden application of cold and damp air, or from the supervention of excessive purging or vomiting, or other rapidly exhausting circumstances, such as sudden terror, or grief, or syncope, or excessive abstractions of blood,) immediate recourse should be had to means that have a tendency to determine the circulation to the surface, such as camphor and opium, carbonate of ammonia, warm bathing, sinapisms to the extremities, and gentle frictions with dry flannel or the flesh-brush. Where the retrocession arises from cold, an emetic, with stimulating frictions, will often promptly recall the eruption to the surface.

Sect. II.—*Vaccina.—Cow-Pox.*

Long before the time of Jenner, it was known in some of the dairy counties of England, that cows are subject to a pustular

disease, which, when communicated to the hands of milkers, renders them insusceptible of the variolous infection. Although this fact was noticed, and even artificial inoculation with the vaccine matter successfully practised in an instance which was formally communicated to Sir George Baker; yet the whole credit of introducing the cow-pox into general notice is due to Dr. Jenner. The benefits which this important discovery has conferred upon mankind are incalculable; and it is not a little consoling to reflect, that as the hand of Providence has in this instance provided a salutary check to one of the most fatal maladies with which man has been afflicted, there may yet be brought to light, at some future period, other antidotal or prophylactic powers against the ravages of diseases, which in the present state of our knowledge, are in a great degree uncontroulable.

Although Jenner had made successful experiments with the vaccine matter as early as the year 1796, he did not publish the result of his investigations until two years after. From that period on, the knowledge of the benefits of vaccination spread rapidly throughout Europe and this country; and there is now no civilized people on earth, amongst whom its blessings have not been largely experienced and gratefully acknowledged.

Various opinions have been expressed with regard to the origin of the vaccine disease. Dr. Jenner, at first, ascribed its source to the *grease* of horses; and this opinion is indeed supported by very strong, though perhaps not absolutely satisfactory evidence. It is asserted by some, for instance, that a pustular disease, in every respect similar to the vaccine affection, may be produced both in the human subject and in cows by inoculation with the matter of *grease*. Friese, Loy, and particularly Sacco,* affirm that they have succeeded fully with this experiment; and Mr. Ring states, that "he succeeded in producing the disease artificially in a cow by removing a scab from the teat, and applying the recent blackish matter of grease to the surface of the sore." The same author has published a letter from Mr. Rankin, relating a case of pustular disease strongly resembling the casual cow-pox, accidentally produced on the face and hands of a farmer, by the fluid oozing from the heels of a horse labouring under grease. It appears, moreover, that persons who have been affected with the pustular disease produced by the matter of grease, are insusceptible of the contagion of small-pox. Dr. Jenner relates a case of this kind. Sheep, also, are subject to a pustular affection about the head and mouth, which is said to be communicable to the human subject, in whom it produces a disease

* Neue Entdeckungen uber die Kuhpocken, die Mauke u. Schaafpocken. Translated from the Italian, by W. Sprengel. 1813.

very similar to that which is caused by the matter of grease, and which it is asserted by Sacco and Richter, renders the human system incapable of receiving the variolous infection. It has also been supposed, that the vaccine disease is essentially the same as small-pox, and that these two affections derive their origin from the same ultimate source. It is conjectured that the small-pox was at first derived from the cow-pox or grease of horses in Arabia, and that in the course of time it gradually degenerated, by passing successively through the human system, until it acquired the known virulence and activity of variolous contagion. In confirmation of this supposition, it is asserted that cases have occurred where the variolous matter, inserted into the udder of cows, produced in them a pustular affection not to be distinguished from the cow-pox. Richter makes this observation on the authority of Gassner.* It is also asserted by Dr. Lisa, that sheep are effectually protected from the disease called sheep-pox, by inoculating them with variolous matter. Sheep inoculated in this way, are said to become affected with but one pustule at the point where the variolous matter is inserted.† The original identity of variolous and vaccine matter has recently been incontestibly demonstrated, if we are to place any reliance on the correctness and veracity of Dr. Ozamann, of Lyons. In a paper which was read at the French Academy of Medicine in July 1830, it is asserted, on the authority of Dr. Ozamann, that the matter of small-pox, if mixed with fresh cow's milk, produces when inserted by inoculation an eruption similar, in all respects, to that of the vaccine virus, and that inoculation with this matter will answer fully for the production of the usual vaccine disease.‡

Symptoms and progress of the disease.—When the vaccine disease is communicated to the human subject, it proceeds through its course in the following manner. Towards the close of the second day after the insertion of the virus, a small point of inflammation may, usually, be seen where the puncture was made. On the third day this point is more distinct; on the fourth, it generally assumes the character of a small pimple encircled by a very faint and narrow inflamed basis or areola. This pimple now gradually enlarges, and on the fifth day begins to assume a perfectly regular and circumscribed form, with a flattened surface, and a small depression at the centre, somewhat darker than the rest of its surface—an appearance which it preserves throughout its whole subsequent course. About this period also, the *vaccine* pock changes from the pimple to a ve-

* Specielle Therapie.
† Mediz. Chirurg. Zeit. 1809. No. xliii. Salzburg.
‡ Rev. Encyclop. Aout. 1830.

sicle, containing a limpid fluid. From the fifth to the ninth day, the pock continues to enlarge in its circumference, but not perceptibly in elevation, so that its flattened appearance becomes more and more conspicuous. About the ninth day the pustule is at its full state of maturity, and it is at this period that the constitutional symptoms (if any occur) begin to show themselves. In some instances the glands of the axilla become painful and swelled, and a state of general languor and drowsiness, with slight creeping chills and alternating flushes of heat occur. Frequently, however, no constitutional symptoms whatever supervene. About the eighth day the slight circle of inflammation which surrounds the pustule in its early period begins to increase, until by the tenth or eleventh day it forms a broad and beautiful areola around the pock. By the eleventh day, the centre of the pustule, which is slightly depressed, begins to assume a darker appearance, and this darkness gradually extends towards the circumference, so that by the fourteenth day the surface of the pustule is converted into a brown scab. This scab becomes darker and darker, until it acquires a deep mahogany appearance. In a few days more, the scab begins to separate at the circumference—still, however, retaining its attachment at the centre ; and eventually falls off, generally between the third and fourth week from the time of vaccination, leaving a slight depression in the skin.

The areola is usually most perfect about the seventh day after the commencement of the pustule, or on the eleventh day after the vaccination, and is attended with some degree of tumefaction and hardness.

The foregoing description answers to the regular progress of the disease ; but various deviations are occasionally observed in relation to some of the particulars just described. In some cases, for instance, the pustule furnishes well-formed vaccine lymph as early as the fourth day of its progress. Much diversity occurs also with regard to the time when the disease first manifests itself after the vaccination is practised ; for in some instances, eight or nine days, and occasionally even a longer period, intervenes between the vaccination and the commencement of the pustule.

It often happens, that on the day succeeding the vaccination, considerable inflammation and elevation of the cuticle takes place at the point where the puncture was made. When this is observed, we may confidently predict the failure of the operation. This inflammation continues for a day or two, and then subsides quickly without leaving any local affection.

It seldom happens that more than the pustule which rises at the point of vaccination appears on the body. Occasionally one or more smaller pustules appear in the vicinity of the primary

one; and instances have occurred, in which a pretty numerous crop of pustules came out on different parts of the body. In the report of the central vaccine committee of France, for 1818–19, it is stated that no inconsiderable number of cases occurred, in which a spontaneous eruption of many pustules appeared after vaccination, and that the matter taken from these pustules produced the disease as perfectly in others, as that taken from the primary pustules.

It is a curious and interesting fact, that the vaccine disease occasionally counteracts or removes other affections of a chronic character—particularly chronic cutaneous diseases. In the report of the French committee just referred to, it is stated that "thirteen medical men have seen examples of vaccination proving the means of curing other eruptions, more especially the *crustea lactea*;" and fully authenticated instances are recorded of the removal of scrofulous swellings, ophthalmia, and hooping-cough, by vaccination. Of the power of the vaccine disease to moderate and abridge the course of hooping-cough, I have myself witnessed several examples.

Another very important circumstance in relation to the mutual influence of the vaccine disease and other cutaneous affections, is the well-established fact, that important varieties and modifications of the vaccine pustule are caused by herpetic and other eruptive states of the skin. Dr. Jenner, in a paper published in the sixty-sixth number of the London Medical and Physical Journal, points out the fact, that a single serous blotch existing upon the skin during the progress of the vaccine vesicle, may occasion such irregularity and deviation from the genuine course and character of the disease, that it cannot be depended on as a prophylactic against the variolous infection. In a letter addressed by him to the medical profession generally, dated April, 1821, he observes: "I have found abrasions of the cuticle to produce the same effect—such, for example, as we find in the nurseries of the opulent, as well as in the cottages of the poor, behind the ears and upon many other parts where the cuticle is tender. We find irregularity in the vaccine vesicle, if the skin is beset with herpetic blotches, or even simple serous oozings from an abraded cuticle. A speck behind the ear, which might be covered with a split pea, is capable of disordering the progress of the vaccine vesicle."

Diagnosis.—An attention to the following circumstances, will enable us to distinguish the genuine from the spurious disease:

1. In the genuine disease, little or no inflammation, except what occasionally arises from the mere puncture of the lancet, can be perceived until about the third day, and sometimes not until several days later. In the *spurious* affection, on the con-

trary, considerable inflammation and elevation of the skin at the punctured point, generally appears as early as the second day.

2. In genuine vaccina, the small point of inflammation which appears three or more days after the matter is inserted, increases gradually until about the seventh day after its first appearance, at which time it is in its full state of perfection. In the *spurious* disease, the pustule arrives at maturity and finishes its course in a much shorter time. By the third or fifth day from the first appearance of the inflammation, scabbing commences.

3. In genuine cow-pox, a beautiful circular and circumscribed areola almost always surrounds the pustule, and this areolar efflorescence is usually in its perfect state about the seventh or eighth day. In spurious affections of this kind, an *irregular* superficial inflammation occurs on the first or second day after the appearance of the pustule; and the pustule itself appears more like a common festering sore produced by a thorn, than a pustule excited by the vaccine virus.

4. The genuine pustule is perfectly circumscribed, with a flattened surface and a slightly depressed centre, and contains a colourless transparent fluid. The spurious pock is more elevated, not depressed in the centre, is irregular or angulated in its circumference, and contains an opaque purulent matter.

According to Dr. Willan, the vaccine vesicle is to be regarded as imperfect when—1, though perfect in its form and appearances, it is without an areola on the ninth or tenth day. 2, when the vesicle is very small, pearl-coloured, flattened, with a hard, inflamed, and slightly elevated base, a dark-red areola, and without a rounded or prominent margin. 3, when the vesicle is small, pointed, with a very extensive pale-red areola. The spurious disease may be produced—1, by the genuine vaccine virus acting on a system affected with some *cutaneous disease*; 2, by vaccinating with matter which has undergone more or less decomposition by long keeping; 3, by vaccinating with matter taken from a spurious pustule; and 4, by the genuine vaccine matter being controlled, or in some way diverted from its regular operation by idiosyncrasy, or a depraved condition of the system.

Some difference of opinion has been expressed with regard to the period at which the vaccine lymph should be taken from the pustule, in order to obtain it in its most perfect and active state. Dr. Jenner advises that the virus be taken a short time before the areola is completely formed, and consequently soon after the lymph is secreted in the pustule, or about the sixth or seventh day. To obtain the virus, the edges of the pustule must be gently punctured with a lancet in several parts. The lymph will then ooze out, and may be collected and preserved between two glasses. Of late years, however, it has been more customary to vac-

cinate from the scab. For this purpose, no scab except from the most perfect pustule should be taken. It should be smooth, of a dark-brown or mahogany colour, and rather brittle than tenacious in its texture. When used, the margin, which is of a lighter colour, should be removed with a knife, and a portion of the remaining dark, hard, internal part reduced to powder on a glass, and moistened or dissolved with a small portion of cold water. In taking either matter or the scab for vaccination, it is of great consequence to be well assured that the person from whom it is taken was healthy, and particularly that he was not affected with any cutaneous disorder. A want of due care on this point, may give rise to extremely unpleasant and even dangerous consequences. I have several times known obstinate and alarming cutaneous affections communicated to children by vaccinating with matter taken from unhealthy subjects. It is a common belief among persons out of the profession, that the vaccine disease is apt to give rise to disagreeable eruptive affections, and such occurrences are in fact not very unfrequent. Accidents of this kind probably depend most commonly on the matter having been taken from persons affected with some cutaneous disorder, or with a general cachectic or depraved habit of body. It seems, nevertheless, that the vaccine disease, communicated by the purest lymph, will occasionally excite pustular and other external inflammatory affections, in persons of a strumous or scorbutic habit.

General remediate treatment is seldom required during the disease. When febrile excitement attends, which is rarely the case, a reduction of the diet, with some mild aperient medicine, diluent drinks, with small doses of spiritus mindereri, or sweet spirits of nitre, should be ordered. In some instances, the inflammation and swelling around the pustule become so great as to demand particular attention. This is most apt to happen when the vesicle is irritated by scratching or rubbing it, at the time when the areola is about making its appearance, more especially when at the same time some other cause supervenes, calculated to produce general febrile irritation. To moderate the violence of the pain and inflammation, a weak solution of sugar of lead, or cold water, or poultices made of lead-water, may be applied to the inflamed part, and laxatives, with some of the milder refrigerant diaphoretics given internally.

With regard to the prophylactic, or protecting powers of the vaccine disease against the small-pox, the opinion of the profession has undergone considerable change within the last ten years. It seems to be pretty generally admitted at present, that the vaccine affection, even in its most perfect state, does not so completely protect the system from the variolous infection, as was formerly so confidently believed. From whatever cause it may

proceed, it is beyond a doubt, that the failures of vaccination in preventing secondary small-pox, "have been steadily and progressively on the increase for some years past." "This circumstance," says Dr. Gregory, "cannot be met by a reference to the fact, that small-pox once gone through, does not always protect the subject from a second attack." Cases of small-pox after vaccination, are far more frequent than second attacks of small-pox. Dr. Gregory has given a table of the total number of admissions into the small-pox hospital in ten different years, and from this statement, it appears that in the year 1810, the proportion of cases of small-pox after vaccination, to the whole number of admissions, was as 1 to 30; while in 1815, it was as 1 to 17; in 1819, as 1 to 6; in 1821, as 1 to 4; and during the year 1823, as 1 to 3½.

Notwithstanding these facts, vaccination must still be regarded as an invaluable means for lessening the amount of mortality, and as deserving all confidence as a protecting power against small-pox. For although it may not, in many cases, render the system wholly insusceptible to the variolous infection, yet the number of instances in which it affords *perfect* immunity from small-pox, is beyond all comparison greater than that in which it fails to afford complete protection; and even where it does not entirely subdue the susceptibility to the small-pox, it almost invariably lessens it to such a degree, as to render this latter disease so mild and simple, as in most instances scarcely to require any remediate attention.

It is believed by many, that the constitutional influence of the vaccine disease gradually diminishes, until the system, though at first protected by it against the variolous contagion, regains in the course of years its original susceptibility to small-pox; and this opinion is in fact strongly countenanced by the results of experience. Some have supposed that the vaccine impression continues only about ten years; others have limited its duration to seven years; and Dr. Leo Woolf, in an interesting memoir on this subject, has adduced facts and reasonings to show that this influence is effaced by the constitutional changes which occur at the age of puberty. That the prophylactic influence of the disease suffers progressive diminution until it becomes, perhaps, wholly effaced, I am myself much inclined to believe, from facts which have come under my own observation; but the attempt to set any precise limits within which the gradual subsidence of this influence is accomplished, must necessarily be attended with great uncertainty; since it may well be supposed, that idiosyncrasy, modes of living, and accidental as well as constitutional predispositions, and perhaps habitual extraneous influences, may give rise to much variation in this respect. From the general fact (if in truth it be so) that the constitutional impression of

vaccination wears out in the progress of time, many physicians have of late recommended re-vaccination, so as to renew its impression on the system; and this practice may be deemed a reasonable, and certainly not a detrimental, precautionary measure.

Various modes have been proposed to test the sufficiency of a recent vaccination, as a protective power against the small-pox infection. For this purpose, some have advised re-vaccination five or six days after the first operation. If the disease is perfect in its influence, a vesicle will rise at the point of the second vaccination, but it will differ in its progress from the first, by becoming surrounded with a complete areola, as early as the second or third day of its appearance, so that the areolæ of the first and second vesicles commence nearly at the same time, and progress *pari passu*. Others have proposed to re-vaccinate about the end of twelve days from the first vaccination. If the first has been perfect, the second vaccination will either not succeed at all, or give rise only to a spurious or irregular pock. The most certain test, however, is inoculation with small-pox matter—a test from which we derive at once our reliance in the general protecting powers of the disease, and in the genuineness of the particular instance.

A distinct, circular, radiated, punctulated, and not very large cicatrix, may be regarded as a pretty certain indication, that the vaccine affection was perfect. When, on the other hand, the scar "is large, and bears the marks of having been formed by high local inflammation, and wants the distinctive characters just mentioned," there is much reason to apprehend that the system has not been secured against secondary variolous disease.

Sect. III.—*Modified Small-pox.*

1. *Varioloid Affections.*

Soon after the general introduction of vaccination, exanthematous affections, closely resembling small-pox, were occasionally observed in individuals, who had previously undergone the vaccine disease in a regular and satisfactory manner. These *varioloid* affections became more and more common; and within the last fifteen years, they have appeared in various countries in frequent and extensive epidemics. In the earlier periods of vaccination, these eruptions were generally regarded as *chicken-pox*, but subsequent inquiries led to the opinion with many, that they are the product of a *peculiar* contagion; whilst others were led to ascribe them to the variolous contagion acting on systems but partially protected against small-pox by previous vaccination; and this appears now to be the general opinion.

From the earliest times of small-pox of which we have any records, this disease has indeed been frequently noticed under various modifications, as remarkable and apparently as distinct as the form we now call varioloid. We find various irregular forms of the disease described by the earlier writers under the names of vesicular, pustular, and spurious small-pox; swine-pox, sheep-pox, stone-pox, horn-pox, &c. all of which were regarded as having but one origin, namely, variolous contagion. After small-pox inoculation was introduced, spurious variola was by no means uncommon; and it has always been observed that genuine and spurious small-pox have in the same epidemics come in and gone out together, in the same manner as they have uniformly been observed to do since vaccination has been introduced.

It appears, therefore, that various circumstances, either of a constitutional or accidental character, may modify small-pox in a variety of ways; and as such modifications were abundantly observed, before vaccination was practised, we need not be surprised that they should be so frequent now, when a new and very extensive modifying cause exists in the influence of the vaccine disease. That the present varioloid disease is in fact nothing but a modified form of small-pox, may be regarded as established by an abundance of direct and conclusive evidence. In the course of my practice, I have met with several instances of varioloid disease, which were unequivocally of variolous origin. Within the present year I produced a well-characterized varioloid eruption by inoculating with small-pox matter a person who had been satisfactorily vaccinated about ten years before. It is unnecessary, however, to adduce any further evidence on this point. The works of several late writers abound in observations illustrative of the variolous origin of this disease. Dr. Thompson, particularly, has placed this view of the subject in a strong light; and to his work on the history of small-pox the reader is referred, for much interesting, and I think conclusive evidence on this point.

By viewing the subject in this light, a great deal of that perplexity and confusion which have existed in relation to those anomalous pustular and vesicular affections, which usually precede or accompany small-pox epidemics, are entirely removed. We perceive that the same morbific agent, modified in its effects on the human system by various causes, lies at the root of all this family of eruptive complaints. They are all, it would appear, the offspring of the same parent, and though diverse in their appearance, they possess enough of family likeness to enable an accurate observer to refer them to a common origin.

——— Facies non omnibus una,
Nec diversa tamen, qualem decet esse sororum.

As the degree of modifying influence of the different causes which are capable of producing variations in the effects of variolous contagion must be extremely various, it is obvious that the irregular or *varioloid* diseases which result from the combined agency of the modifying causes, and the virus of small-pox, must be correspondingly diverse; and we find indeed so great a diversity in this respect, that no description can be given of them which can have more than a general application. I confine myself, at present, to the consideration of that form of varioloid disease which results from the action of small-pox virus on a system that has previously undergone the vaccine influence.

In many instances, as has been already stated, vaccination protects the system *completely* against infection from small-pox contagion. In other cases, the system is either only partially freed from its aptitude to variolous infection, or this susceptibility, though for a time entirely subdued by the vaccine influence, gradually returns and regains a greater or less degree of intensity. The disease which results from the action of small-pox contagion on a system thus partially deprived of its variolous susceptibility, and which has of late years been so common, deviates more or less conspicuously from regular small-pox, and is, in a great measure, divested of the dangerous character of the latter affection.

Symptoms.—In a large proportion of cases of *varioloid*, the eruptive fever is so mild and inconspicuous, as scarcely to attract any attention. In some cases, however, the fever is as violent as in the severer instances of small-pox. In point of duration, too, it is very irregular, terminating sometimes as early as the second day, and at others not until the fifth day from its commencement. In all instances, whether mild or violent in its symptoms, the eruptive fever ceases suddenly on the appearance of the eruption; so that patients who were confined to bed during the first three or four days, are generally up and about after the eruption has come out. In many cases a transient uniform efflorescence precedes the appearance of the eruption; and a rash resembling measles, also, is not an unfrequent precursor of the varioloid eruption. The varioloid exantheme almost always appears at first in the form of small papulæ, many of which dry off without becoming either vesicular or pustular. Frequently, however, these small, firm, red papulæ are converted into vesicles containing a watery limpid fluid, in the course of the first, and sometimes not until the second day. About the third or fourth day these vesicles usually burst, or wither without assuming a pustular character, the fluid in them acquiring a whey-like appearance. In many instances, the vesicles are surrounded with a small and faint areola. "This variety," says Dr. Thompson, "in the mildness of the eruptive fever, the strictly vesicu-

lar character, short duration, and mode of disappearance of the eruption, corresponded (in the epidemic he describes) so exactly with the descriptions usually given of the mildest varieties of *chicken-pox*, as not to have been distinguishable from that disease." In many cases these vesicles become filled with a puruloid fluid, are slightly depressed in the centre, and by the third or fourth day, changed into thin, dark scabs, which separate and fall off usually about the sixth or seventh day after the appearance of the eruption. Occasionally the scabs do not separate until the tenth or even the twelfth day. Sometimes the vesicles remain distended with a colourless serum for four or five days, and then become pustular, containing a pus-like fluid, in which state they usually remain a few days longer before desiccation or scabbing commences. In most cases of varioloid disease after vaccination, papular, vesicular, and pustular eruptions are interspersed through each other at the same time. Not unfrequently the disease assumes so nearly the appearance and character of distinct small-pox, that it is difficult to decide during the first five or six days, whether it should be regarded as a modified or regular variolous affection; and cases sometimes occur, in which the varioloid eruption is so abundant as to resemble confluent, rather than distinct small-pox. Very generally, however, the smallness of the pustules, the whey-like fluid which they contain, and particularly the early period at which they begin to dry and scab, will enable us to distinguish such cases from genuine small-pox. Dr. Thompson observes, that the areola and its pustule sometimes exhibit a remarkable resemblance to the areola and vesicle of the cow-pox—a resemblance which betrays the mixed variolous and vaccine character of the disease.

Varioloid pustules very rarely leave any depressions in the skin. When the scabs remain adhering a long time, they occasionally leave slight pits; but much more commonly warty or fungoid elevations remain.

From the foregoing account, we perceive how extremely various this affection is both in its general and local phenomena. We see that in some instances it exhibits a striking resemblance to chicken-pox, in others it approaches very near to genuine small-pox, and in some instances it exhibits no small degree of resemblance to the vaccine pustule. Notwithstanding this extreme irregularity of modified small-pox, the following circumstances may be stated as its most common and characteristic features.

1. The eruption appears in successive clusters, occurring at uncertain periods between the second and fifth day.

2. The eruption seldom, if ever, enters into complete suppuration, as do the small-pox.

3. The eruption is not attended with fever, except in very violent cases.

4. Desiccation or scabbing invariably occurs much earlier than in regular small-pox;—commencing generally as early as the fifth or sixth day; and the scabs usually separate by the eighth or ninth day, leaving red disks or tuberculous elevations instead of depressions.

That the system should, in many cases, still remain liable to the morbific effects of the small-pox contagion after the process of vaccination has been undergone, is by no means surprising, when we reflect how often second attacks of genuine small-pox have been known to occur. The greater frequency of a second infection by variolous contagion in those who have suffered vaccination, than in persons who have already had small-pox, may be ascribed, in part at least, to some imperfection or disturbance of the vaccine affection, by which its prophylactic power is more or less weakened or destroyed. Dr. Jenner believed, that in all cases where small-pox occurs after vaccination, it is owing to the vaccine vesicle having been disturbed or rendered imperfect by one or more of the following circumstances, viz. 1, preoccupation of the skin by some chronic cutaneous affection; 2, the use of spurious vaccine matter; 3, depriving the vaccine vesicle incautiously of its lymph, or otherwise injuring or irritating it by external violence, so as to give rise to common phlegmonous inflammation.

Without doubt, however, modified small-pox, or a second variolous infection resulting in a spurious or modified form of the disease, may and often does occur after vaccination apparently the most complete and satisfactory. When we see small-pox occurring in the same individual a second time, even after a most severe attack of the disease, we cannot hesitate to believe that the same may happen after perfect vaccination, for it is not reasonable to presume that vaccination can be a more certain preventive of the small-pox infection, than a severe attack of the small-pox itself. Indeed, facts illustrative of this truth have been abundantly recorded within the last ten years; and it may now be regarded as established, that vaccination does not in all instances afford immunity from the partial influence of the small-pox contagion. It may be no less true, that a great majority of modified small-pox after vaccination, depends on some accidental imperfection in the vaccine disease, either from constitutional idiosyncrasy, or from the causes just mentioned. It would seem from some observations of Dr. Gregory, that the aptitude to variolous infection, after vaccination, prevails in an especial degree in some families. The same writer infers from facts which have come before him, that modified small-pox, subsequent to vaccination, is most apt to occur in persons between the ages of

fifteen and twenty-one. This corresponds with the opinion mentioned before, that the vaccine impression is probably weakened, or partially obliterated, during that general constitutional change which takes place at the age of puberty. My own observations, though limited, lead me to the same conclusion expressed by Dr. Gregory, with regard to the age at which the present disease is most apt to occur. By far the greater number of cases of modified small-pox that I have yet seen, were in young people between the ages of fifteen and twenty-one.

Modified or spurious small-pox, as has already been intimated, is not, however, confined to those who have been subjected to the vaccine influence. It occurs also in persons who have had small-pox; as well as in those who have never had either this or the vaccine disease. This fact has been adduced in evidence, that the *varioloid* disease arises from a peculiar contagion radically distinct from that which produces small-pox. It is contended, that if this malady were not a peculiar or specific affection, it could not reproduce itself in its characteristic form in persons who had not undergone the modifying influence of small-pox, or of the vaccine disease. In reply to this argument against the identity of these affections, it may be stated, that, on the presumption of their common origin, the varioloid eruption is an *imperfect* result of the variolous contagion; and it is therefore reasonable to infer that the virus of this imperfect form of the disease is also modified, or incapable of producing the genuine affection, unless an extreme degree of susceptibility to the disease exists. That the varioloid disease does, however, sometimes produce genuine small-pox in the unprotected, the authority of Thompson and others does not permit us to doubt; and I have myself seen at least two striking examples of this kind.

As to the production of varioloid affections by the small-pox contagion in those who have already had small-pox, there does not appear to exist any difficulty in accounting for it satisfactorily. We know that an attack of small-pox does not always obliterate the constitutional predisposition to the variolous contagion. Even after the system has passed through the most perfect form of the disease, a second attack will in some instances occur. Now, between that state of the system produced by small-pox, which affords perfect immunity from a second infection, and that state in which the susceptibility to a subsequent attack is undiminished, a vast variety of grades of susceptibility must, we may reasonably presume, occur, according to individual idiosyncrasy, temperament, accidental concomitant influences, and perhaps the activity of the variolous contagion. If then after an attack of small-pox, the predisposition to this disease is not entirely, but only *partially* destroyed, ought we not to look for an imperfectly developed form of the disease, should a second infection

take place? It is in this way, we believe, that varioloid, or varicellous eruptions occur in persons who have once undergone small-pox. As to the occurrence of varioloid affections in those who have never had either small-pox or the vaccine disease, it may be observed, that the degrees of natural susceptibility to the variolous contagion, are almost infinite in variety in different individuals. We see in the same family, into which this contagion is introduced, one individual affected so slightly as scarcely to require attention; another perhaps only indisposed with variolous fever, without any eruption; a third one seized with a pretty severe attack of the distinct small-pox; and a fourth affected with the most aggravated variety of the confluent form of the disease. We may presume, therefore, that where the small-pox contagion acts on a system which is either naturally or accidentally indisposed to the full influence of its powers, it will produce either an extremely mild variolous eruption, or an irregular or modified one—in other words, a varioloid or varicellous affection.

From these and other considerations, I am induced, in common with many others, to regard varioloid as a variety of spurious or modified small-pox, or at least as being referrible, for its ultimate source, to the same contagion which produces this disease.

2. *Varicella.*

As early as the time of Rhazes, exanthematous affections were noticed, which, though they did not appear to protect the system against the small-pox, bore a very strong resemblance to this disease. These varioloid eruptions were described by Vidus under the name of *crystalli*; and Senertus observes, that there are varieties of small-pox, which, instead of becoming filled with pus, are distended with a watery limpid fluid, *which dry off in a few days.* Riverius also speaks of these varioloid eruptions as common in his time; and we find them mentioned by the writers of that period under various denominations—as bastard-pox, spurious-pox, lymphatic-pox. Sydenham speaks of them as a spurious variety of small-pox; and Sauvages has given a description of them under the name of *variola lymphatica.*

Up to the time of Morton, who introduced the term chicken-pox, the general opinion among physicians was, that *varicella* is an imperfect variety of small-pox. There were some, however, even at this period, who entertained a different opinion, regarding the disease as a peculiar or radically distinct exanthematous affection. In 1767, Heberden published a memoir,* in

* Transact. of the College of Physicians, vol. i.

which he endeavoured to show that varicella is the result of a peculiar contagion, totally distinct from that which gives rise to small-pox. This soon became the prevailing opinion on this subject, and continued to be so until its correctness was again called in question by Dr. Thompson* and other recent writers.

The principal arguments that have been alleged against the common origin of these affections are:

1. The occurrence of epidemic small-pox without varicella; and the occasional prevalence of varicella without the occurrence of small-pox. So far, however, as my inquiries extend, every epidemic small-pox that has been particularly described, has been preceded, accompanied, or immediately followed by anomalous or varioloid affections, bearing the characteristic marks of varicella. Granting, however, that epidemic small-pox may have existed without the concomitant appearance of varicella, it does not follow that these affections are radically distinct. It is quite possible, that from the influence of certain atmospheric constitutions, the human system generally may at one time be so susceptible to the action of the variolous contagion, that nothing but the genuine and regular form of the disease can be developed: —or so insusceptible as to enable this contagion to produce only a spurious or varicellous disease. From this or some other occult causes, the small-pox itself, assumes the most dissimilar characters. Some epidemics are mild; others severe; and others malignant to a great degree: sometimes the pustules become filled with a bloody matter, and at others they are "*crystalline.*" What reason then is there to doubt that the contagion may at times be so feeble, or the human system so indisposed to its influence, as to admit only of the production of a mild vesicular disease.

2. Varicella is more common now than before vaccination was introduced, when small-pox was more prevalent. This, however, only shows that since vaccination is practised, there are more systems insusceptible to the full effects of the variolous contagion than before this epoch, and argues therefore in favour of their identity.

3. Varicella occurs equally in those who have had small-pox, in those who have been vaccinated, and in those who have never had either of these affections. To this argument we may reply, that it is generally admitted, that varicella occurs much more frequently in those who have had small-pox, or the vaccine disease, than in the unprotected. Drs. Bryce and Abercrombie saw but three cases in which varicella took place in persons who had not either of the former affections.

4. Varicella, it is alleged, cannot be communicated by inocu-

* An Account of the Varioloid Epidemic, &c. By John Thompson, M. D. &c.

lation. This is an error. Heim, who is quoted below, asserts that they are very communicable in this way; and Dr. Thompson, in his work on varioloid affections, gives abundant testimony on this point.

5. The occurrence of small-pox does not prevent or modify varicella. Dr. Thompson, however, asserts, that out of one hundred and fifty-five persons whom he saw pass through the small-pox, "not one was afterwards affected with vesicular disease, although upon the supposition of the co-existence of a varicellous and a variolous epidemic, most, if not all of this number must have been exposed to the influence of both contagions." If, indeed, we adopt this argument as valid, we must conclude the small-pox and the vaccine disease are essentially the same disease, for, as is well known, they mutually prevent or modify each other.

Symptoms.—Varicella is seldom attended with much fever. In many cases the febrile symptoms are scarcely obvious, yet in some instances the eruptive fever is almost as violent as in the severer cases of small-pox, and is attended with the same pains in the back, head, and extremities, as in this latter affection. The initial fever continues from one to three days, and terminates in the appearance of a vesicular eruption, which usually comes out first on the breast and back, next on the face and scalp, and lastly on the extremities. A troublesome tingling or itching in the skin generally accompanies the eruption. The eruption is often preceded, for a few hours, by a general erythematous rash, as in small-pox, or varioloid after vaccination. The varicellous vesicles generally come out in succession during three or four days, so that at the same time, some of them will be just appearing; others fully formed and filled with lymph; whilst some will be shrivelling, and others again be already converted into scabs. The vesicles, in different cases, assume different appearances; and this has given rise to a division of the disease into three varieties; namely, the *lenticular*, and the *conoidal varicella*, and *swine-pox*. The eruption, in the first of these varieties, comes out very early, and consists, at first, of small, rather oblong, red, flat, and shining elevations, with a minute vesicle in the centre, which by the end of the second day is somewhat enlarged and distended with a whitish lymph. This fluid assumes a pale yellow colour on the succeeding day, and on the following or fourth day, the vesicle becomes shrivelled, and in two days more is converted into a small brown crust. The scabs fall off about the ninth or tenth day, leaving red marks, but no depressions on the skin.

In the second, or *conoidal* variety, the vesicles appear suddenly, and are surrounded by a slightly inflamed margin. On the first day they are elevated, pointed, and filled with a limpid

serum; on the second day they are more distended, and contain a very pale yellowish fluid. On the third day they wither; and at this time some of them contain a purulent matter; and these vesicles generally leave pits in the skin when the scabs fall off. Scabbing commences on the fourth day, some of the scabs acquiring a dark brown, and others a yellowish and semi-transparent appearance. "A fresh eruption of vesicles usually takes place on the second and third day; and as each set has a similar course, the whole duration of the eruptive stage in this species of varicella is six days; the last formed scabs, therefore, are not separated till the eleventh or twelfth day.*

The third variety of varicella, or *swine-pox*, is characterized by large *globose* vesicles, with irregularly circumscribed bases, and inflamed margins. The transparent serum with which they are distended, assumes a whey-like colour on the second day after their appearance, and on the succeeding day they begin to shrivel, and some of them contain a purulent fluid. (Bateman.)

Varicella may be communicated by inoculation; and, it is alleged by Heim, that they are even more communicable than regular small-pox.† Reil states, that small-pox is generally much milder when it occurs *after* varicella, than where this disease has not been gone through, more especially if the varicellous affection has been severe.‡ Varicella, like small-pox, rarely occurs more than once in the same individual. It is never attended with secondary fever; but the scabs, on falling off, not unfrequently leave depressions in the skin. The pits, or cicatrices, left by the varicellous eruption, differ considerably from those which are produced by small-pox; and Heim, who regarded these two affections as essentially distinct from each other, has adduced this circumstance among others in support of his views. The pits of varicella, he asserts, are whiter than the rest of the skin, and quite smooth or even; whilst those left by variolous pustules are the colour of the surrounding skin, and uneven like the surface of an orange. The margin of the varicellous pit is smooth and rounded; in the pits left by small-pox it is generally somewhat indented or angulated. Hairs never grow in the disks of the former, in those of the latter they do.

With regard to the remediate management of varioloid affections, it is only necessary to observe, that where the disease is so severe as to demand any medical attention, the treatment is to be conducted on the same plan that has been mentioned as proper in the milder varieties of small-pox. Varicella, however,

* Bateman, Practical Synopsis of Cutaneous Diseases.

† Heim, in Horn's Archiv. fur Medicinische Erfuhrung, bd. vii. heft. 2, Jahrg. 1809.

‡ Ueber die Erkenntniss und cur der Fieber. bd. 5. s. 386.

very seldom requires any medicinal applications. Gentle aperients, and a mild antiphlogistic diet, is commonly all that is necessary.

Sect. IV.—*Rubeola, morbilli.—Measles.*

By the American, English, and French physicians, the terms *rubeola* and *morbilli* are applied to the same disease—*measles.* The German writers, on the contrary, universally designate two distinct diseases by these terms—applying the latter only to the present affection, whilst the term *rubeola* is used by them to designate a different, though somewhat similar disease (röthlen,) described by Willan, under the name of *roseola.*

Measles, like small-pox, seldom occur more than once in the same individual; and it would seem that a second attack of the former is even less frequent than of the latter malady.* I have met with one unequivocal instance only of this kind.

Home mentions a singular instance, where an attack of measles was followed by enlargement of some of the lymphatic glands. After a lapse of about six months, the glandular swellings subsided, and the patient became a second time affected with measles.† It does not appear, however, that the morbillious contagion possesses the same degree of activity as that of small-pox. Many individuals never become affected with the disease, however frequently they may be exposed to its contagion; and it is by no means uncommon to find in the same family some affected by it, whilst others will escape infection, though constantly exposed to its miasm.

Measles rarely occur sporadically. When they appear, many individuals usually become affected with them at the same time; and the progress of the disease can never be traced from house to house, or from street to street, as we may frequently do with small-pox or scarlatina. This, among other facts, has been adduced in evidence that the disease is not propagated by contagion; but the fact of its being communicable by inoculation, may be deemed sufficient to settle the point of its contagious character. Dr. Home succeeded in communicating the disease in this way in a number of instances; and more recent experience has fully demonstrated the practicability of morbillious inoculation.‡

* See Dr. Baillie's paper, in the Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge, vol. iii.

† Medical Facts and Experiments. Richter, Specielle Therapie.

‡ Vogel, Percival, Brown, Monro, and Tisset, recommended inoculation for measles; and Home and Horst practised it with success. More recently, Professor Sparanza, in an epidemic which prevailed in the territory of Mantua, employed inoculation for measles with decided advantage. Six boys in the House

In its general course and phenomena, this, like other epidemic diseases, is subject to prominent modifications; and systematic writers have, in consequence, divided it into several varieties, according to the regularity or irregularity of its symptoms, the nature of the attending fever, and the character and violence of the local affections. It is evident, too, that this disease is much under the influence of atmospheric constitutions; for at one period it will be marked by symptoms so slight as scarcely to require any medical attention; at another it will appear under a highly aggravated form; in a third period we may find it to occur under every grade of violence, from the simplest to the most malignant grades; and in a fourth, it "will hold a middle course between the mildest and most dangerous forms of the malady." (Armstrong.) Upon the whole, however, the regular and moderate cases are incomparably more frequent than the instances of a violent or malignant character.

In general, measles are apt to be more regular and mild during the warm and equable, than the cold and variable seasons; and constitutional habit or idiosyncrasy appears to have a very decided influence in modifying its character. It is from this latter circumstance that we sometimes meet with measles in all its grades of violence in children of the same family—several very remarkable instances of which have come under my observation.

It would seem, from the observations of some, that the *morbillious fever* sometimes occurs without any exanthematous affection.* Fevers, accompanied with the usual catarrhal symptoms of this disease, though without the measly eruption, are by no means uncommon during the prevalence of epidemic measles; and Richter observes, that persons who have been thus affected, generally afterwards escape the morbillious disease during the subsequent progress of the epidemic.

Symptoms.—The period of incubation, or the time which intervenes between the first impressions of the contagion of measles, and the actual commencement of the disease, varies from a few days to two and even three weeks. In general, however, from five to seven days, may be regarded as the latent period

of Industry, and afterwards he himself, were inoculated. In all, a mild and regular morbillious affection was the result. The experiment was afterwards repeated by himself and others with equal success. "A slight cut was made into one of the most vivid of the large blotches with a lancet, the point of which was covered with the blood effused. With this, small incised punctures were made on the arm, and a proper bandage applied." *Edinb. Med. and Surg. Journ.* 1826. *See also, Bibliotheca Italiana. Agosto,* 1825.

* Morton mentions a morbillious fever which was wholly unaccompanied by an exantheme; and De Haen asserts, that cases of this kind frequently occur during epidemic measles. (*a*)

(*a*) *Febr. divis.* vi. *s.* 6. *See Reil's Fieberlehre. b.* v. *p.* 216.

of the infection. In the patients which were inoculated by Home, the eruptive fever generally commenced about the seventh day after the insertion of the contagion.

The initial phenomena of morbillious fever do not differ from those which usually attend the beginning of catarrhal fever. A slight tenderness and redness of the eyes, with an increased flow of tears, sneezing, cough, and a watery discharge from the nostrils, together with slight creeping chills, and transient flushes of heat, are generally among the first symptoms of the disease. In some instances, the affection of the eyes and mucous membrane of the nose and respiratory passages does not supervene until about the second or third day of the fever. In all cases, however, prominent catarrhal symptoms sooner or later occur, and may be considered as among the specific phenomena of the disease. The cough is at first dry and harsh, and is attended with oppressed breathing, and some degree of soreness in the fauces. Some of the lymphatic glands along the neck and margins of the eyelids often become swollen and tender. About the third day, and occasionally earlier, considerable nausea and vomiting is apt to occur; and where the febrile symptoms run high, slight delirium sometimes takes place on the evening of this day. In cases of a violent character, more or less coma sometimes precedes for a few hours the appearance of the eruption; and in small children convulsions are by no means uncommon at this period. The fever is generally decidedly synochal; the pulse, in the ordinary forms of the disease, being frequent, hard, and quick, and the skin dry and very hot. Generally between the third and fifth days, the eruption makes its appearance in the form of small red spots, apparently papular, first on the forehead, chin, nose, and cheeks, and then successively on the neck, breast, body, and extremities. These red spots, which resemble fleabites, soon enlarge; and as their number increases, they run into each other, and form larger patches, of an irregular or semilunar shape,* leaving intermediate spaces in which the skin retains its natural colour. During the first day of the eruption, we may often notice a small vesicle in the centre of some of the measles. (Cazenave.)

During the second day after its appearance, the eruption in the face is at its highest state of development. On the following day it begins to fade and subside, whilst on the rest of the body it is still vividly red. On the face, the eruption may be felt slightly elevated above the surface of the skin; but on the other

* Bateman observes, "that this character of the blotches of the measly eruption, (their tendency to assume the irregular crescent shape,) was first noticed by Willan, and is important; for although entirely overlooked by ordinary observers, it is commonly very manifest, and therefore a valuable diagnostic."

parts the red patches do not appear to be sensibly raised. In severe cases, the whole face becomes considerably swollen; and in some instances the tumefaction is so great, as almost to close the eyelids. The fading and subsidence of the eruption proceeds over the body in the same progressive manner that it made its appearance, so that by the eighth day from the commencement of the fever, it begins to disappear on the back of the hands, where it is wont to remain longest. About the ninth day, the eruption presents a faint yellowish appearance, and desquamation commences on the face, which by the tenth or eleventh day is completed over the whole body. The morbillious eruption is not confined to the surface of the body. It appears in red spots on the gums; over the mucous membrane of the mouth; upon the tonsils and uvula; and, according to Frank, on the tongue. Leutaud saw the measly exantheme in the œsophagus, and upon the mucous membrane of the trachea, and even upon the surface of the abdominal and thoracic viscera.*

The fever does not remit on the appearance of the eruption; on the contrary, both the febrile and catarrhal symptoms usually become sensibly increased when the rash comes out. As soon, however, as the eruption begins to fade, an evident amendment in all the symptoms usually takes place; and in most instances, the fever disappears entirely by the time the rash has desquamated. Occasionally, indeed, the fever and cough continue, and even become worse after the complete disappearance of the measly exantheme. The coma, Dr. Heberden observes, sometimes returns in violent cases, after the rash has gone off.

About the time the eruption begins to decline, more or less diarrhœa is apt to supervene, which, if not violent, almost always mitigates the general and local symptoms. Sometimes copious diarrhœa takes place just before the rash is about making its appearance. This is to be regarded as an unfavourable occurrence, since it tends to interfere with the regular progress of the eruption, or to cause it to retrocede.

Authors generally state that the eruption of measles makes its appearance about the fourth day; and in the majority of instances this will be the case. It is of some importance, however, to bear in mind, that even in cases which go on regularly, the rash often comes out much earlier, and occasionally also later than the period just mentioned. Dr. Armstrong observes, "that the rash does not uniformly nor generally appear on the fourth day from the first development of the reaction. I have seen," he says, "the eruption come out at all times, between the first and the seventh days, though perhaps, the most common period is be-

* Precis. de Médec. p. 604.

tween the third and fourth days after the occurrence of reaction."

Such are the ordinary course and phenomena of measles. In its general character, as well as in the particular phenomena, it is subject, however, to various irregularities and modifications, which often demand especial attention in the treatment of the disease. Throughout the whole course of measles there is generally a considerable tendency to inflammation, particularly of the eyes, and the respiratory organs. Armstrong divides the disease into three varieties or modifications, the *simple*, *inflammatory*, and *congestive*, and to these we may add the *typhous* and the *gastric* modifications.

1. *The inflammatory* variety,* is characterized by a high grade of synochal fever; the pulse is vigorous, hard, and frequent; the skin dry and very hot; the cough violent, painful, harsh and dry; the cephalalgia severe, attended frequently with considerable delirium during the night; the eyes very red; and the respiration much oppressed and often painful. Pleuritis; peripneumonia with bloody expectoration; cynanche trachealis; bronchitis; cerebral inflammation; or gastro-enteritis, are particularly apt to supervene in this modification of the disease. The rash commonly appears early, and is generally vividly red.

2. The *congestive modification* of the disease, is characterized by the usual phenomena of an internal congestive state of the system. The reaction takes place slowly and imperfectly, and in some instances remains entirely oppressed. The face is pale, the pulse feeble and labouring, the bowels torpid, the breathing oppressed and slow, and the vital energies generally much depressed. If the internal congestions are not removed, coma or stupor, and in many instances, convulsions, ensue. The eruption does not make its appearance, or it comes out slowly and imperfectly on some parts of the body. The extremities are cold, and the features sunk and anxious. This form of the disease is most apt to occur in young children, and in persons of a feeble and delicate habit of body. Dr. Armstrong has seen two instances of this kind, in which the patients died comatose and convulsed. In both cases he found the lungs greatly engorged on post mortem examination.

3. The *typhous*, or as it has been called, *malignant* variety of measles, is attended with the ordinary characteristic symptoms of a typhous state of the system. The heat of the skin is burning or acrid, (*calor mordax;*) petechiæ appear on those parts of the skin not occupied by the measly rash; colliquative

* Strictly speaking, every case of measles is inflammatory; but the general and local phlogistic phenomena often predominate to such a degree, that such cases may with propriety be distinguished by the term *inflammatory*.

hæmorrhages, diarrhœa, and profuse sweats, are apt to occur; the vital energies are greatly depressed; the pulse generally weak and frequent, and sometimes nearly natural. This variety of the disease, is always frightfully malignant and fatal. Fortunately, however, its occurrence is not common, although authors have described several epidemics of this kind. Sir William Watson has given an account of a putrid morbillious epidemic; but as he appears to have considered measles and scarlatina, modifications of the same disease, it may be doubted whether the affection he describes was the former or the latter malady. Nevertheless, the description he gives of the particular phenomena of the disease, answers much more unequivocally to measles than to scarlet fever.*

4. The *gastric modification* of measles, derives its distinguishing phenomena from gastro-intestinal irritation, which in some instances modifies the general character of the disease very prominently. In cases of this kind, the febrile symptoms are not very conspicuous; the pulse is small, weak, and unusually frequent; the cough is short, almost constant, and distressing. Violent vomiting and purging sometimes occur before, and immediately after the appearance of the eruption. The tongue is brown; the pain in the forehead severe; the measly rash pale and often indistinct; and a sense of tension and fulness is often felt in the epigastrium, or short cutting pains in the bowels. In some instances, great difficulty of breathing, and a sense of pectoral oppression, suddenly comes on, particularly in young and irritable children. Sometimes the patient is extremely restless, with much jactitation, an anxious expression of the countenance, and dyspnœa, particularly on assuming the erect position. (Dr. Armstrong.)

Several German writers† describe a variety of morbillious disease under the name of *false measles*, which corresponds with the *rubeola sine catarrho* of Willan, and the *rubeola sine febre* of others. This modification of rubeola is characterized by a regular measly rash, without either catarrh, ophthalmia, or fever. It does not protect the system against a subsequent attack of febrile measles. "An interval of many months, even two years, has been observed, between this variety and the subsequent febrile rubeola; but the latter more frequently takes place about three or four days after the non-febrile eruption." (Bateman.)

Sequelæ.—It has already been observed above, that the tendency to local inflammations is always very considerable in

* Watson.—*Medical Observations and Inquiries*, vol. iv. p. 132.

† Vogel, Handbuch, Bd. 3, p. 203. Metzger, Vermischte Schriften. Bd. 2. p. 167.

measles, and this tendency is generally particularly conspicuous during the periods of desquamation and convalescence. There are few, if any diseases, which leave the system so susceptible to the injurious influence of cold as measles; and it is, perhaps, chiefly from this circumstance, that inflammatory and other affections are so frequent during convalescence from this disease. It is indeed a common observation, that the affections which are apt to supervene on an attack of measles, are more to be dreaded than the disease itself,—and in reference to the ordinary or regular form of the disease, the remark is generally correct.

The affections most apt to occur after measles, or during the period of desquamation, are pneumonia, croup, rheumatism, chronic ophthalmia, otitis, arachnitis, and bronchitis. In phthisical habits, an attack of measles often develops the tubercular action rapidly. It would seem that the morbillious affection has an especial tendency to develop lymphatic diseases, and to rouse into action the strumous habit. Porriginous eruptions about the head, serous ulcerations behind the ears, scrofulous ophthalmia, strumous swellings about the neck, and other scrofulous disorders, are frequent sequelæ of the disease. Sometimes induration of the mesenteric glands, and marasmus, ensue. Herpes, anasarcous swellings, discharges from the ears, and boils on different parts of the body, are among the occasional consequences of this disease.

Diagnosis.—From the earliest records we have of this disease, down to the time of Withering, (1793) measles were generally confounded with scarlet fever.* The diagnosis between these two affections, is indeed sometimes attended with considerable difficulty; yet the catarrhal symptoms, and the character of the morbillious eruption, will always enable an experienced observer to distinguish rubeola from scarlatina. The small vividly red spots, like flea-bites, their union into irregular semilunar patches, and the natural colour of the intermediate skin, distinguishes the measly rash from the large, irregular, more uniform, and raspberry-coloured efflorescence of scarlatina. In the former disease, the rash generally consists of small red spots running into each other, with the central points more vivid than the coalescing margin, so as to give a maculated appearance to the skin. In the latter disease, the redness is more diffused and uniform, consisting of an infinite number of very minute red points united together, resembling much the redness of a *boiled lobster*. These two affections differ from each other also in their general course or progress. The rash of measles gene-

* Bateman says, that "the publication of Dr. Withering's Essay on *Scarlet Fever*—or rather the second edition of that work in 1793, may be considered, perhaps, as the date of the correct diagnosis of this disease."—*Synopsis*, p. 66.

rally comes out about the fourth day from the commencement of the fever. In scarlatina the eruption usually comes out on the second, and not unfrequently on the first day. The coryza, sneezing, hoarse, and dry cough, inflamed and watery eyes, so rarely absent in measles, can seldom fail to establish a certain diagnosis.

Prognosis.—Measles is not, in general, a very dangerous disease. It is only from becoming complicated with internal inflammation, or from having its regular progress interrupted by some accidental cause, that the disease is apt to assume a very dangerous character. However violent the proper morbillious symptoms may be, provided the disease goes on regularly in its course, the danger is not often very great. According to the estimate of Percival, about one out of fifty cases of rubeola terminates fatally; and of this proportion one half are in subjects under two years old. Epidemics of this disease, of the most fatal character, have indeed been noticed.* Violent internal congestions, so as to prevent the development of febrile reaction, the sudden retrocession of the rash, soon after its appearance, from violent purging, the application of cold, or spontaneously, or from whatever cause, always greatly increases the danger. The occurrence of internal inflammation, particularly of the lungs, brain, or trachea, is a very alarming accident. Great difficulty of breathing, with a wheezing sound in the trachea, though not depending on inflammation, is attended with much danger in infants. Colliquative hæmorrhages, petechiæ, and great muscular prostration, are among the most unfavourable signs. Women in the latter period of pregnancy, or in the puerperal state, are exposed to great risk from an attack of this disease. In general, nervous, delicate, and debilitated subjects, are more apt to sink under this disease, than persons of healthy and vigorous constitutions.

Treatment.—In relation to the treatment of this disease, the practitioner will do well to bear in mind the important truth contained in the following observation of Dr. Armstrong. "From an impartial consideration of the facts which have come before me," says this writer, "I am convinced that our plan of treating measles (in its regular form) is too uniformly active when the eruptive fever is developed; and that we should be more fortunate in the main, if we interfered less with the operations of nature in cases of a mild and regular character." Of the importance of this observation I am thoroughly persuaded, both from my own experience and from what I have had occasion to witness in the practice of others. Even where the general febrile

* It is from the great fatality of such epidemics, that this disease obtained the name *morbillus*, or little *plague*. Were these epidemics measles? Both small-pox and scarlatina were formerly confounded with measles.

excitement is considerable during the eruptive fever, an active antiphlogistic or depletory treatment is not only generally unnecessary, but sometimes decidedly injurious, provided no local inflammations be present. We must view the eruption in this, as in other exanthematous affections, as a sort of critical or metastastic deposition on the surface, by which the animal economy endeavours to relieve itself from some internal morbific irritation. The appearance of the rash is essential to the perfect and safe resolution of the disease, and whatever greatly interferes with the regular progress of the precursory fever, has a tendency also to interrupt the regular appearance and character of the eruption. When, therefore, the eruptive fever is regular, not very violent, and unattended with internal inflammations or congestions, the remediate treatment should be gentle. In general, all that is required in such cases, is to keep the bowels open by mild laxatives, and to allow the patient the free use of tepid diluent drinks; and in instances attended with a very moderate degree of febrile reaction, some of the mildly stimulating diaphoretic ptisans, such as infusions of sage, elder blossoms, marjoram, balm, or eupatorium, should be ordered. In cases attended with a high grade of fever, moderate abstractions of blood are, without doubt, proper, and ought certainly not to be neglected. The refrigerant diaphoretics, also, are decidedly indicated, and often suffice, without bleeding, to procure an adequate reduction of the general excitement. I have generally preferred the following mixture.* Small doses of antimonial wine, with sweet spirits of nitre, the saline effervescing draught, the ordinary nitrous powders, and particularly the mixture mentioned at page 147, may be usefully employed for this purpose.

Although an active treatment is unnecessary, and often prejudicial in the regular form of measles, this is by no means the case when the disease becomes complicated with visceral inflammation, oppressive internal congestions, or other irregular and dangerous symptoms. When, after the initial stage of oppression, the febrile reaction does not take place, and the face remains pale and sunk, the pulse feeble, the breathing oppressed, with great prostration, and a torpid state of the sensorial powers, prompt and decisive measures must be adopted to remove the internal congestions, and to excite the reaction of the heart and arteries. If this be not effected, the eruption will not come out, and the patient will sink into a state of fatal stupor or coma. The treatment already given as proper in the congestive form of ty-

* ℞. Muriatis ammoniæ ʒiii.
Pulv. extract. glycyrrh. ℥ss.
Tart. antimonii gr. i.
Aq. fontanæ ʒviii. M. Dose—a dessert spoonful every two hours for a child between two and five years old.

phus, must be actively employed in such cases. The warm bath, stimulating frictions of the skin, hot flannel, or bottles filled with hot water applied to the body and extremities, sinapisms to the epigastrium, together with the use of warm and gently stimulating drinks, are the principal means upon which our dependence is to be placed in instances of this kind. Dr. Armstrong recommends moderate bleeding; but although a great advocate of depletion in the congestive state of fevers, he thinks that in congestive measles the lancet should be used with particular caution. The observations I have made on this point, when speaking of the treatment of typhus, are equally applicable in this place. In several instances of congestive measles, I have employed camphor, suspended in a mucilaginous fluid, with obvious benefit. I have also used the carbonate of ammonia, in the formula mentioned at page 166, with very good effect in a few instances of this kind. Both these stimulants are, however, more decidedly beneficial, where the rash, after it has come out, suddenly recedes, than in the congestive state which precedes the exantheme. If in cases of this kind, great difficulty of breathing, with a short dry cough, an irregular distribution of the animal temperature—"some parts being cool or cold, whilst others are preternaturally warm," and a feeble and quick pulse, with a death-like paleness of the face occurs, the danger is imminent, and unless prompt relief be obtained, "the patient sinks rapidly under an apparent load of phlegm in the bronchia." (Armstrong.) *Camphor* especially is a valuable medicine where a retrocession of the eruption occurs. Armstrong speaks very favourably of a large dose of calomel, in union with camphor, the pulvis antimonialis, and a few drops of laudanum, in this congestive condition of the disease. When this accident is produced by excessive diarrhœa or vomiting, opium in union with camphor is the appropriate remedy. In conjunction with these remedies, blisters, sinapisms, stimulating frictions, the warm bath, or warmth applied to the surface in a dry way, may be deemed indispensable in such cases. It should be observed, however, that moderate diarrhœa, except in very feeble subjects, is rarely attended by any unfavourable effects; and in most instances procures considerable relief. In robust and plethoric subjects especially, a moderate looseness of the bowels should not be interfered with, unless symptoms of its injurious influence upon the regular appearance and course of the rash supervene. (Armstrong.)

In cases complicated with visceral inflammation, a vigorous antiphlogistic treatment is demanded. Whatever may be thought of the employment of bleeding in simple and regular cases, there can be no question as to the general propriety of resorting to this measure promptly and actively when visceral inflammations supervene. General and local abstractions of blood; blisters ap-

plied over the region of the affected part; mild laxatives; antimony; and nauseating doses, are the measures upon which our chief dependence must be placed. When bronchitis or peripneumonia supervenes, much good may often be derived from *antimonial emetics*, more especially in very young children. Whatever organ, in short, may become the seat of the inflammation, it will be necessary to adopt such measures as are proper for the existing inflammation, independent of the morbillious affection, paying attention only to the grade or character of the accompanying fever.

Measles, attended with pneumonic and other varieties of visceral inflammation, have indeed occasionally occurred, in which bleeding is said to have been not only useless, but often unequivocally detrimental. Of this kind was the very fatal epidemic which prevailed at Paris in 1828; which, though almost always complicated with inflammation of important organs—more especially with pneumonia, was found unmanageable by sanguineous evacuations.* In cases of this kind, opium and calomel would perhaps answer well. I say perhaps; for I have had no experience in instances of this dangerous and typhoid character; yet, from the excellent effects which I have derived from this combination in *pneumonia typhoides*, I should without hesitation give it a trial in this modification of measles. Blisters, cupping, and the warm-bath, may be deemed indispensable in such cases.

It is of great importance, in the remediate management of measles, to guard the patient against the influence of variable temperature. Neither a very cool, nor a warm and confined air, is proper in this disease. An equable temperature, which produces neither a feeling of much warmth nor *chilliness*, is the most suitable. When the eruptive fever is very moderate, and the patient of a feeble and irritable habit, the temperature of the sick chamber should be such as to communicate a moderate sensation of warmth, and this is more especially proper in congestive cases.

I have already adverted to the various disagreeable and dangerous affections which are apt to ensue during convalescence from this disease, and to their frequent dependence on the injurious effects of cold during this period. To obviate such consequences from this source, the patient ought to remain within doors, and to avoid every other exposure to the influence of a cold and damp atmosphere. "Even in summer, convalescents should not be suffered to go out of doors except in the middle of fine days, and not without additional apparel." (Armstrong.)

The diet, during the declension of the disease and period of

* See Biett's Report in the *Journal Hebdomadaire*, No. xlii.

convalescence, should be mild and unirritating, and all kinds of stimulating drinks be carefully avoided. If the skin is dry and the pulse remains irritated after the rash has disappeared, advantage may be obtained from some of the more gentle antiphlogistic diaphoretics, and it will often be proper to continue their use during convalescence. The spiritus mindereri, with a small portion of sweet spirits of nitre, and of vin. antimon. forms an excellent diaphoretic at this stage of the disease. Where the pectoral symptoms continue to be troublesome during convalescence, the *muriate of ammonia*, with vinegar of squills, and antimony, is one of our most useful remedies.* Tonics are almost always injurious during convalescence from measles. When the system is left exhausted and free from irritation, mild nourishing diet, with a weak infusion of serpentaria, will usually answer to promote the return of vigour and health.

I conclude what I have to say on this subject, by the following very interesting observations of Dr. Armstrong: "It is a remarkable fact," says this writer, "that when any cutaneous affections arise after measles, the internal organs generally remain free from disease; and even where some internal disorder has existed, I have not unfrequently seen it disappear on the occurrence of some spontaneous eruption of the skin. Indeed there are many cases of this nature already on record. At all times, we should, therefore, be most wary in meddling with vesicles, pustules, boils, and the like, when they come out after the measles; for although they may be temporary blemishes on the surface, they are often the occasion of saving the vital works within."

Sect. V.—*Scarlatina.—Scarlet Fever.*

Scarlet fever appears under every grade of violence, from the simplest and least dangerous to the most severe and malignant forms of disease. *Fever*—a peculiar *exanthemè* and *inflammation in the fauces*, terminating rapidly, in some instances, in ulceration and sloughing, constitute the essential phenomena of the disease. In relation to the particular character and violence of these morbid conditions, authors have divided the disease into three varieties, namely, *s. simplex*, *s. anginosa*, and *s. maligna.*

* ℞. Muriat. ammoni. ʒiii.
P. extract. glycyrrh. ℥ss.
Aq. fontanæ ℥vii.
Acid. scillæ ℥ss.
Vin. antimon. ʒi.
M. S. Dose—a table-spoonful every 4 hours for an adult.

Symptoms of s. simplex.—After an indefinite period, varying from one to three or four days, of the ordinary premonitory symptoms of febrile diseases, the patient is seized with slight chills, alternating with transient flushes of heat, depression, nausea, pains in the loins, lower extremities, and head, a hot and dry skin, and a frequent and quick pulse. Generally within the first forty-eight hours after the commencement of the fever, a scarlet eruption comes out, first on the face, and then successively on the neck, trunk, and extremities, spreading finally over the surface of the mouth, fauces, and nostrils, and may even in some cases be seen on the albuginea. This rash consists of innumerable red points, which, running into each other, give a diffused blush to the skin, resembling much the shell of a boiled lobster. (Armstrong.) In some cases, the scarlet efflorescence is uniformly diffused over the whole surface of the body; in others, it appears only in large irregular blotches, leaving the intermediate portions of skin of the natural colour. The miliary glands and papillæ of the skin are usually somewhat enlarged, giving a slight roughness to the surface, more especially on the breast and extremities. When the skin is pressed with the point of a finger, the redness disappears for a moment, leaving a transient white spot. With the commencement of the fever, or soon after its accession, a slight soreness and some difficulty of swallowing occurs, and the voice in most instances becomes thick and less sonorous. In most instances, the face becomes slightly swelled; the tongue is covered with a thick white fur, through which the enlarged papillæ exhibit their scarlet points, and its edges and extremities are generally red; the skin is very hot; and the pulse frequent, quick, and sometimes tense and vigorous. There is seldom much thirst, and the appetite is always much depressed. Considerable restlessness, and occasionally slight delirium, occurs during the evening exacerbations, both of which symptoms, however, generally disappear on the approach of morning.

On the fourth day, the eruption and fever are generally at their complete state of development, and on the fifth day both usually begin to decline, and continue to diminish, *pari passu*, until they have gone off entirely, about the end of the seventh day. On the following day, the skin begins to desquamate. When the eruption is about disappearing, the tenderness of the fauces abates; the perspiration is free; the urine deposits a copious reddish sediment; and in some cases diarrhœa takes place. Desquamation is usually attended with considerable itching, and frequently leaves a slight tenderness of the skin over the whole body. Occasionally a considerable abatement in the febrile symptoms takes place as soon as the eruption makes its appearance. In some instances, indeed, the fever is from beginning to end

so slight as scarcely to attract notice; but on the other hand, cases occur in which the general arterial excitement is very strong. The disease sometimes commences and proceeds for a day very mildly, and then suddenly assumes all the violence characteristic of the *anginose* variety.*

S. Anginosa.—In this form of the disease, the fever and the anginose affection are much more violent than in the former variety. The forming stage of *s. anginosa* is almost always attended with considerable headach, præcordial oppression, nausea, sometimes vomiting, and general muscular prostration. The fever is accompanied, from its commencement, with a feeling of stiffness and dull pain in the muscles of the neck and under the ears and angles of the jaw. Frequently, indeed, these local symptoms precede the occurrence of the fever; and on examining the fauces, the palate, tonsils and uvula present a red and slightly tumid appearance. The voice soon becomes hoarse, deglutition painful and difficult, and respiration is attended with a disagreeable sense of constriction in the throat. The febrile symptoms rise rapidly to their acme; the pulse acquires great frequency and quickness, but it is rarely either so vigorous, tense, and full, as in the simple variety of the disease. The thirst is generally urgent, and the heat of the skin more intense than in any other febrile affection. Currie and Willan have found the temperature of the surface as high as 108 and even 112 degrees of Fahrenheit's thermometer. The tongue soon becomes dry, and very florid, along the edges, with the inflamed papillæ projecting from its surface. Considerable uneasiness or pain is felt in the head, and much restlessness, languor, and prostration prevails throughout the whole course of the disease.

The eruption does not generally come out as early in this, as in the simple variety. It usually makes its appearance on the third day of the fever, and is seldom diffused over the whole surface, coming out in irregular and not very large patches on different parts of the body, particularly about the elbows. In some instances, the efflorescence disappears the day after it has come out, and "reappears partially at uncertain times, but with-

* In reference to cases of this kind, Dr. Armstrong makes the following observations. "Simple excitement may readily produce inflammation, and in fact is the most frequent cause of it; for if there be a latent weakness in any organ, the simple excitement, if not timely moderated, is sure to give rise to inflammation there. It is on this account, that many diseases merely marked by simple excitement at the beginning, are complicated with inflammation in their progress; and hence it is, that apparently benign seizures of scarlatina may eventually become the causes and concomitants of serious affections of some of the viscera. It is, indeed, only in subjects of the soundest constitutions that we ever see simple excitement uncombinedly exist throughout the disease; and the reason why it so frequently occasions inflammation is, that some tissue or other had been secretly in fault before its occurrence.—*On Measles, Scarlatina, &c.* p. 157.

out any corresponding changes in the general disorder; and the whole duration of the complaint is thus lengthened, and the desquamation is less regular." (Bateman.)

When the fever declines as early as the fourth or fifth day, the tonsils and palate seldom become ulcerated, the swelling and inflammation in the fauces passing off with the fever and the eruption without ulceration; but, when the fever is protracted beyond this period, or when it is violent during the first three or four days, small ulcers form about these parts, which are rapidly converted into ash-coloured superficial sloughs. There is always a considerable quantity of viscid mucus secreted in the fauces, which often concretes into white flakes upon the inflamed parts, and presents the appearance of ulcers where in reality none exist. The parts should, therefore, be carefully examined before an opinion is expressed as to the existence of ulcers. (Armstrong.) As the fever declines, the sloughs in the throat begin to separate, and leave red ulcerated surfaces, which generally cicatrize without difficulty. Sometimes, however, instead of separating about the eighth day, the sloughs enlarge, become brown, and discharge an acrid sanious fluid; and in such cases the glands about the neck are generally swollen, hard, and painful; and the patient is harassed with painful diarrhœa and tenesmus. The inflammation occasionally extends into the trachea, and the patient dies under symptoms of acute bronchitis. The brain often becomes prominently affected during the eruptive stage, giving rise to deep and fatal coma. Abdominal inflammations may likewise supervene. "At first there are only slight pain and soreness in some part of the abdomen, with a quickened pulse and hurried respiration; but the pain and soreness gradually increase, and at length are attended with vomiting, eructation, fulness of the belly, and general restlessness. In six, seven, or eight days, the abdominal soreness and pain abate or disappear, while the pulse grows rapid and feeble, the breathing more anxious, and the vomiting more urgent. Cold clammy sweats, and an universal collapse, now speedily supervene, and are the immediate precursors of death." (Armstrong.)

S. Maligna.—Although this form of the disease usually commences like the preceding variety, it soon betrays its violent and dangerous character. The eruption comes out at uncertain periods from the second to the fourth day; and is usually pale when it first makes its appearance, acquiring, in most instances, a dark or livid hue in the progress of the disease. It is also very irregular in its duration, and often suddenly disappears soon after it has come out, and reappears on some parts of the body two or three days afterwards. The temperature of the skin is variable, and not generally very intense; and the pulse, though in the commencement active, becomes small and feeble in the course

of the second day. Delirium generally occurs at an early period, and often continues with occasional intermissions, and exacerbations, throughout the subsequent course of the disease. In nearly all cases the sensorial functions suffer very considerable disturbance; and, in aggravated instances, the eyes are dull and inflamed, and the cheeks suffused with a livid flush. The tongue is dry, and covered with a brown or dark fur; the breath fetid. On examining the fauces, gray-coloured sloughs are seen on the soft palate and tonsils, which soon acquire a brown, and at last a dark colour. The disease, however, sometimes terminates fatally under symptoms of cerebral oppression, before the ulcers in the throat become extensive, or acquire a very bad appearance. "In general," says Dr. Armstrong, "it is only when the fever is protracted beyond the fourth day that the ulcers are converted into ill-conditioned, black, and fetid sloughs." There is generally a large quantity of very viscid mucus secreted and lodged in the fauces, giving rise to difficulty of respiration and a rattling noise in the throat. When the sloughs are foul and extensive, a thin acrid fluid is usually discharged from the nose, occasioning irritation and excoriation of the parts with which it comes in contact. In cases of a particularly violent character, collapse supervenes towards the middle or end of the second week of the disease. When this occurs, the heat of the surface sinks; the pulse becomes very frequent and feeble, the tongue dark, brown, or black, the animal powers greatly prostrated; painful diarrhœa often ensues, and in some instances petechiæ and hæmorrhages from various parts occur towards the fatal termination of the disease. The fever and ulcerous affection of the throat frequently exist without an eruption at any period of the disease. Death sometimes takes place as early as the second or third day, and Bateman observes, that occasionally the symptoms continue to be moderate until at an advanced period, when they suddenly assume a malignant and rapidly fatal character.

Dr. Armstrong has described *three* modifications of *malignant* scarlet fever—namely, the *inflammatory*, the *congestive*, and the *mixed*; the latter being attended, he says, at once with much internal congestion, and a moderate reaction of the heart and arteries.

The first of these modifications (inflammatory) corresponds with the *putrid* variety of Richter.* It commences with violent fever; the pulse is full, strong, and hard; the heat of the surface intense; delirium occurs early; in short, all the symptoms indicate a high grade of inflammatory excitement. The eruption comes out early, and is at first vividly red, assuming a darker or purple hue as the disease advances. In its commence-

* Specielle Therapie, bd. ii. p. 466.

ment, and for a day or two, it resembles *s. anginosa*, differing from this variety in the early supervention of a typhus state or collapse, and in the affection of the throat assuming, in a few days, the gangrenous condition mentioned above. At an early period of the disease the animal powers sink; the pulse becomes small, feeble, and frequent; the heat of the surface acrid and burning; the rash purplish; colliquative diarrhœa and hæmorrhages, and occasionally petechiæ, or a miliary eruption, ensue. The most characteristic circumstance of this modification, however, is the extremely violent degree of the anginose affection, and its decided and early tendency to terminate in extensive gangrenous ulceration. It is this modification of the disease that was formerly commonly described under the name of putrid sore-throat.

In the congestive modification, the reaction does not ensue. The patient becomes pale, faint, and oppressed; he complains of deep-seated pain and a sense of weight in the head, attended with giddiness, nausea, much anxiety and oppression in the præcordia, and great muscular prostration. Respiration is quick, short, or slow and impeded; "and there is often a mixture of lividity and paleness in the face, and the eyes are usually dull, acquiring a fatuous or inebriated expression in the course of the disease. The mind, at first alarmed and confused, or dejected, soon becomes disordered with delirium; or an indifference to surrounding objects, and a stupor succeeds, under which patients frequently expire." The pulse is slow, irregular, and weak; at first the tongue is covered with a white fur, which becomes rough and brown in the progress of the disease. The bowels are torpid in the beginning, but towards the termination of the disease, diarrhœa almost always occurs in fatal cases. This modification of the complaint seldom runs a protracted course, and frequently proves fatal as early as the second, third, or fourth day. Colliquative hæmorrhages from the nose, mouth, and bowels; petechiæ and gangrenous spots, are by no means uncommon towards the fatal conclusion of the disease. In this modification, the rash, from the commencement of its appearance, is pale, or of a copperish hue, acquiring at last a purple aspect.

The anginose affection is seldom very violent. Dr. Armstrong thinks that the affection of the throat is rarely the cause of death —its fatal tendency depending chiefly on the "venous congestions of the brain, liver, spleen, lungs, and of the vessels of the heart, giving rise to universal collapse and visceral disorganization," and perhaps to a change in the constitution of the blood itself.

Sequela.—Scarlatina, like measles, is frequently followed by various troublesome and often dangerous disorders; amongst which, *anasarca* is by far the most common. There is, indeed,

no acute disease which is so apt to be succeeded by dropsical effusions as scarlet fever; and this is especially the case with the *anginose* variety. These swellings seldom occur before the ninth or tenth day after the eruption has gone off, and continue usually two or three weeks. Bateman observes, that "when the anasarca becomes pretty general, a sudden effusion occasionally takes place into the cavity of the chest, or into the ventricles of the brain, occasioning the death of the patient in a few hours." In general, however, the dropsical effusions which occur after scarlatina, are not attended with much inconvenience or danger. The malignant and anginose varieties are sometimes followed by abscess of the tonsils, enlargement of the parotids, inflammation of the testicles, ophthalmia, deafness, and inflammation of the mucous membrane of the alimentary canal, otitis, suppuration of the glands about the neck, chronic cough, excoriations about the nates, and bronchitis, or other slow suppurative inflammations, with hectic fever and its consequences. It is observed by Dr. Armstrong and others, that the hair is very apt to come out on the abatement of scarlatina, and that it often never looks or grows well afterwards. Various nervous affections have also been known to occur as sequela of this disease:—such as hysteria, spasmodic asthma, chorea, epilepsy,* and neuralgic pains in the extremities. Strumous affections, chronic cutaneous eruptions, gutta serena, herpes, and rheumatic pains, are occasionally the consequence of the disease. The more perfectly and obviously the cuticle desquamates, the less apt are secondary diseases to supervene during convalescence.

Diagnosis.—The only diseases with which scarlatina is liable to be confounded, are measles and miliary fever; and in the simple and anginose varieties, the diagnosis is indeed sometimes attended with very considerable difficulty. There is not a single symptom which can be regarded as absolutely peculiar and characteristic of scarlet fever. The eruption is sometimes wholly or nearly absent, is diffused or in blotches, and occasionally papular; and the angina varies from only a slight redness to much tumefaction, with or without ulceration and sloughing. Nevertheless, the following circumstances will almost always enable us to distinguish scarlatina from measles. In the former the eruption generally comes out within the first forty-eight hours of the fever; whereas in measles the rash rarely appears until the third, and most commonly not until the fourth day. The eruption in scarlatina appears like a diffused erythematous blush of the skin, with innumerable points, intermixed with small papulæ, dispersed over the cuticle. The rash of measles,

* Kreysig. Abhandlung über das Scharlachfieber, &c. p. 59. See also Cappel. Abhand. von Scharlachsausschläge, p. 90. Reil. Fieberlehre. Bd. 5. p. 122.

on the contrary, consists of small circular dots like flea-bites, of a deeper red in the centre than at the circumference, so that, in running into each other, the skin presents a less uniform blush than in scarlatina. These red and slightly elevated dots generally appear in clusters or patches, assuming an irregular *crescent shape.* "The crescent-like form of the patches of measles," says Bateman, "and the more diffuse and irregular shape of those of scarlatina, will be a material diagnostic guide." The colour of the eruption of scarlatina usually resembles that of a boiled lobster shell. In measles it is generally of darker red, inclining slightly to brown. The most prominent diagnostic symptoms between these two affections, however, are the catarrhal phenomena, which are almost invariably very conspicuous in measles, whilst in scarlatina they are either altogether absent, or extremely slight and partial. The inflamed eyes, profuse discharge of tears, sneezing, coryza, strong, harsh, and hoarse cough, intolerance of light, and red and swollen edges of the eyelids, so seldom absent in measles, are but very rarely noticed in scarlet fever. In the malignant and anginose varieties of scarlatina, the ulceration and sloughs which appear in the fauces are sufficiently characteristic to distinguish this affection from measles.

In some instances, simple scarlatina assumes so much the general appearance of miliary fever, that on slight examination it might be readily mistaken for this latter affection. They may be distinguished by the miliary eruption being almost universally attended with considerable perspiration, which is not the case on the appearance of the efflorescence of scarlatina. The little points or miliary papillæ of the rash of scarlet fever, rise out of a uniformly erythematous blush of the skin, whereas those of miliary fever appear to be seated on a skin possessing its natural colour. The coming out of the miliary eruption is generally attended with great anxiety in the præcordia; and when it is about declining, a second eruption, similar to the first, sometimes comes out; and in some instances a third crop of papulæ supervenes.

Prognosis.—The prognosis in scarlatina must of course be extremely various, since the disease assumes every grade from the mildest to the most fatal degrees of violence. In the simple variety, little or nothing in general need be apprehended for the safety of the patient, unless dangerous secondary affections supervene during the declension or period of convalescence, from cold or other accidental causes. But the prognosis ought to be cautious, even in cases which appear at first under mild symptoms; for the disease will sometimes go on for a few days in a regular and simple form, and then, all at once, assume a highly dangerous grade of violence: and this is more especially

apt to be the case when the epidemic generally is of a severe character. The *anginose* variety of the disease, can never be regarded as free from particular danger; and the malignant variety is to be accounted among the most fatal maladies. It is generally, and perhaps justly, considered that the danger in scarlatina is to be estimated by the character and violence of the affection of the throat. Dr. Armstrong, however, seems to be of a different opinion; at least, the affection of the throat abstractedly considered, he thinks, is rarely the cause of death—a termination which he refers rather to violent internal venous congestions and visceral disorganizations, so common in the more violent grades of this disease. When the eruption is bright red, and uniformly diffused over the whole or the greater part of the body, the prognosis is better than when it is pale or purple or brownish, and appears only here and there in large patches. (Armstrong, Reil.) A variable eruption, being by turns red, pale, and brownish; appearing now principally in one part, and then in another; going off for a time, and again making its appearance, or finally suddenly, and at an early period, vanishing entirely, are unfavourable indications. A white streak passing down on both sides of the nose and encircling it below, is said to be a fatal symptom. (Reil.) If on a sudden a strong inclination to pass urine occurs, and a copious flow of crude watery urine takes place, the danger may be considered great. (Richter.) When the inflamed fauces are of a bright red colour, considerably tumefied and attended with painful swallowing, the prognosis is better than when the inflamed parts are dark-red or livid, and without swelling and difficult deglutition. White sloughs in the fauces are more favourable than ash-gray or brown ones. The occurrence of gangrenous ulceration is of course of very alarming import.

It is scarcely necessary to say that the grade and character of the attending fever has an important bearing on the prognosis. A moderately active state of the reaction is favourable; a typhus grade is the reverse; and when the fever is extremely violent at first, with much angina, there is great reason to apprehend early and dangerous collapse. Violent internal venous congestions, by which the development of febrile reaction is prevented or much impeded, is always indicative of the utmost danger. The supervention of visceral inflammation is no less alarming. These are generally soon followed by collapse, and if death does not take place early, great prostration ensues, with the fatal symptoms of coma, constant delirium, cold extremities, and if to these are added petechiæ, colliquative hæmorrhages, and involuntary evacuation of feces, a speedy dissolution may be predicted with certainty.

In general, scarlatina is apt to be more mild in children than

in adults, except when the former are suffering from painful dentition. The disease is said to be most dangerous when it occurs in persons between the ages of fifteen and twenty-five.* It is also attended with particular danger when it attacks pregnant women, and especially in the puerperal state. In general, robust and healthy individuals bear the disease much better than persons of a weak, lymphatic, and nervous temperament.

A regular abatement of the heat and efflorescence of the skin, accompanied with a lateritious sediment in the urine; a subsidence of the swelling, and of the frequency of the pulse; with separation of the sloughs and healthy granulation of the ulcers; and finally, desquamation of the cuticle, are indicative of a favourable termination of the disease.

Cause.—Scarlatina arises from a specific contagious miasm or principle, which like most other febrile contagions, appears to be much under the influence of certain occult atmospheric temperaments, as is manifest from its occasional epidemic prevalence, as well as from the various grades of violence and diversity of character which different epidemics have been known to assume. It agrees, moreover, with the contagion of small-pox and measles, in destroying the susceptibility of the system to its subsequent morbific influence; although exceptions to this rule have been noticed, the disease having in some instances, though extremely rarely, occurred a second time in the same individual. There has been much controversy in relation to this latter point. Withering and Willan assert that they never witnessed a second attack of the disease, and they deny the possibility of this occurrence; and Bateman observes, "that this fact is now fully ascertained." Cases of second attacks have nevertheless been adduced by authorities equally respectable, and the reality of this occurrence, though rare, appears to me sufficiently established.

Bicker,† Neuman,‡ Binns, and others, mention instances of this kind; and Richter observes, that cases of a second, nay even a third attack of scarlatina have been noticed.§ Some individuals are wholly insusceptible to the operation of this contagion, and never become affected with the disease, however frequently they may be exposed to its cause. Accidental predisposition, age, and idiosyncrasy of constitution, have of course as great influence on the activity of this as of other contagions. The period which intervenes between the first impressions of the contagion and the manifest commencement of the disease, varies from three to

* Reil. loc. cit. vol. v. p. 138.

† Beschreibung eines Scharlachfiebers.—Rotterdam, in 1778 and 1779, p. 162.

‡ Aufsätze und Beobachtungen fur Aerzte, p. 284, as quoted by Reil. loc. cit. t. v. p. 136.

§ Specielle Therapie, bd. ii. p. 440.

five or six days. It is asserted that the contagion emanating from an individual affected with the disease, is most active during the period of desquamation. (Cazenave.) Although unequivocally depending on a peculiar contagion, yet "there is abundant evidence that fever attended with scarlet eruption, and possessing all the other characters of this disease, does occasionally arise from exposure to cold."*

Scarlatina occurs at all seasons, but it has been observed that warm and damp weather, and the air of low and marshy districts, have a tendency to promote the dissemination as well as the violence of the disease. It is also said, (Reil, Richter, Steiglitz,) that this disease is more apt to affect females than males; and general observation goes to show that nurslings and old persons are much less subject to the influence of its contagion than individuals during the intermediate ages. Some epidemics affect scarcely any but children; others seize almost exclusively on adolescents and adults. Reil says that he has seen malignant epidemic scarlatina which was almost entirely confined to persons between the ages of fifteen and twenty-five. The progress of epidemic scarlet fever is sometimes very irregular. The disease, though very violent and general, sometimes suddenly abates so as almost to disappear, and after a while resumes its power and rages with still greater malignity. Occasionally the contagion appears to linger for several years in a certain district, a few patients only becoming, from time to time, affected with the disease.

Treatment.—From what has been said of the various symptoms and characters which scarlatina may present, it is at once obvious, that the remediate management of the disease must be greatly modified in the different varieties which it is wont to assume. In the simple form of the disease, nothing but the mildest antiphlogistic treatment is necessary. One or two gentle aperients, or enemata; a mild unirritating liquid diet; cool or tepid drinks, such as barley-water; toast-water, acidulated with lemon-juice, or muriatic acid, or lemonade; confinement in a moderate and equable temperature; with the use of slightly astringent and emollient gargles—such as sage-tea, with a small portion of alum, and sweetened with honey; or an infusion of green tea, is all that it is, in general, necessary to resort to in cases of this kind. But even the simple form of the disease occurs, occasionally, under symptoms of very considerable febrile irritation, and may, by the continuance of the high excitement, assume the severer character of scarlatina anginosa. No regard should, therefore, be paid to the mere decision of its being a simple form of the disease; but where the general excitement

* Gregory's Elements of the Theory and Practice of Physic, vol. i. p. 244.

runs high, it will be prudent to adopt a more active antiphlogistic treatment, and to regulate it in such a manner as to restrain the phlogistic tendency without interfering too much with the regular, and we may presume, necessary excitement of the heart and arteries. Although it may be true, nay most assuredly is true, that the "nimia diligentia medici," has done more harm in simple scarlatina than the disease itself, yet the intelligent and experienced practitioner has a safe and a sure guide in the grade of the existing symptoms, to direct him in the application of antiphlogistic measures.

It is moreover to be observed, that in the onset of the disease, it is not always in our power to decide satisfactorily whether its subsequent course will be simple or complicated, or severe and dangerous. However mild, therefore, the general character of the prevailing epidemic may be, it will be proper, whenever we are called to a case during the forming stage, attended with considerable lassitude and oppression, paleness of the face and skin, some headach and nausea, to commence the treatment as if the disease were about assuming an aggravated character. An emetic will under such circumstances frequently do much good by removing internal venous congestions; and after its operation, a brisk mercurial purge may be given with advantage. In cases attended with considerable affection of the head during the forming stage, Dr. Armstrong advises the use of the warm bath strongly impregnated with salt. "This practice," he says, "assisted by a brisk purgative, will in general give immediate relief, and contribute powerfully to moderate the subsequent reaction." When the subsequent febrile excitement becomes strongly developed, it should be moderated by purgatives, tepid affusions, cooling drinks, rest, ventilation, and some of the milder diaphoretic remedies—such as spiritus mindereri, sweet spirits of nitre, or small doses of nitre and antimony.*

In the *anginose* form of the disease, a much more energetic course of treatment is requisite. Almost all writers agree in recommending the use of emetics in the beginning of this, as well indeed as in the other varieties of scarlatina. The earlier they are resorted to, the more beneficial, in general, will be their effects; and it is particularly in the forming stage, or at the very onset of the febrile excitement, that they may be employed with decided usefulness.† When given at this early period, they frequently

* Armstrong. Treatise on Scarlatina, Measles, &c.

† Numerous authorities, of great weight, might be quoted in evidence of the good effects of emetics in this disease. They are recommended by Tissot, (Avis au Peuple;) Stoll, (Ratio Medend. tom. ii. p. 248;) Withering, (Account of Scarlet Fever and Sore Throat, &c. as it appeared at Birmingham in 1773, and London in 1779, p. 300;) Steiglitz, (Versuch einer prüfung und verbesserung der yezt gewöhnlichen behandlungsart des scharlachfiebers, p. 241;) Richter,

moderate the whole subsequent course of the disease, and in some instances almost completely break up the train of morbid actions. They have indeed been recommended throughout the whole course of the disease, (Withering,) but general experience goes to show that the commencement of the disease is the only proper period for their employment. The good effects of an emetic in the beginning of the disease depend, probably, chiefly on the centrifugal direction which active vomiting communicates to the circulation, and thereby obviating internal congestions and secondary inflammations; and perhaps, also, by weakening the morbid sympathies established by the cause of the disease.

Purgatives have of late years been strongly recommended in this affection, and they are, without doubt, often highly useful, although there formerly existed much prejudice against their employment. The utility of this class of remedies in scarlatina, is particularly insisted on by Dr. Hamilton;* and all modern writers speak favourably of this practice. My own experience, though limited in this variety of the disease, has strongly impressed me with the utility of moderate purgation in this affection, and with the exception of an antimonial emetic in the commencement, I have in most instances confined myself almost entirely to the employment of aperients, with cooling applications to the surface, an antiphlogistic regimen, and the local applications to be mentioned hereafter. The judicious employment of laxatives in the early periods of the disease, is the most effectual measure for preventing the occurrence of colliquative diarrhœa in the latter stage—an occurrence which is always attended with danger. It is by no means necessary, or, as a general rule, even proper, to use active purges. From three to four evacuations in the course of twenty-four hours are sufficient to procure all the advantages which purgatives can afford,† unless cerebral congestion exists, when active catharsis will be very proper.‡

With regard to the employment of antimonials and the usual diaphoretic antiphlogistics, experience does not furnish us with any satisfactory evidence of their usefulness. "In truth," says Dr. Bateman, "the temperature is too high to admit of a dia-

(Specielle Therapie, Bd. ii. p. 480;) Reil, (Fieberlehre, tom. v. p. 166;) Armstrong, (on Scarlet Fever, &c.;) Rush, (Medical Inquiries.)

* Treatise on Purgatives.

† Bateman, Gregory, Richter, Reil, Willan. Dr. Armstrong, however, recommends active purges in preference to the milder articles of this class, in the anginose variety of the disease.

‡ Rhubarb and calomel; rhubarb and soda in equal parts; calomel with small portions of antimonial powder, (Willan;) calomel, followed by a small dose of magnesia; small portions of the sulphates of soda or magnesia; an occasional dose of two or three grains of calomel, with the daily use of a dose of castor oil, or the administration of laxative enemata, may be used for this purpose.

phoresis; and the only safe and effectual method of producing this effect, consists in reducing the heat of the surface *by the application of external cold.*" Richter, nevertheless, speaks favourably of the internal employment of the muriate of ammonia, when the fever is strong, after the bowels have been regularly evacuated.* It should be given in union with tart. antimon. in the way directed at page 95. If notwithstanding the use of purgatives, and the other remedies already mentioned, the inflammatory condition increases, and the patient becomes anxious and very restless, the use of diluted sulphuric acid, in large and frequent doses, is, according to the experience of Stieglitz, a valuable remedy. (Abhandl. für Pract. Arzte. B. xxii. p. 307.) The application of cold water to the surface of the body, cannot be too strongly recommended in the higher grades of this affection. "We are possessed of no physical agent," says Bateman, "as far as my experience has taught me, (not excepting even the use of blood-letting in acute inflammation,) by which the functions of the animal economy are controlled with so much certainty, safety, and promptitude, as by the application of cold water to the skin, under the augmented heat of scarlatina and of some other fevers. This expedient combines in itself all the medicinal properties which are indicated in this state of disease, and which we should scarcely *à priori* expect it to possess, for it is not only the most effectual *febrifuge* (the 'febrifugum magnum,' as a reverend author—Dr. Hancoke—long ago called it,) but it is in fact the only *sudorific* or *anodyne* which will not disappoint the expectation of the practitioner under these circumstances. I have had the satisfaction, in numerous instances, of witnessing the immediate improvement of the symptoms, and the rapid change in the countenance of the patient, produced by washing the skin. Invariably, in the course of a few minutes, the pulse has been diminished in frequency, the thirst abated, the tongue has become moist, a general free perspiration has broken forth, the skin has become soft and cool, and the eyes have brightened; and these indications of relief have been speedily followed by a calm and refreshing sleep." The only precaution that it is necessary to observe in the application of cold water to the surface in this and other febrile diseases, is to see that the skin is above the natural temperature, and dry, and that no feeling of chilliness be present. When the arterial excitement is vehement, and the temperature of the surface intense, the water should be applied by pouring or dashing it over the body; but where this mode of using it is impracticable, or objected to on the part of the patient or his friends, we may obtain our object by washing or sponging the skin with cold water, or

* Specielle Therapie, B. ii. p. 490.

vinegar and water, and this should be repeated every hour or two, until the desired reduction of the heat and arterial excitement is effected. Dr. Armstrong observes, that as the disease advances, instead of cold, *tepid* affusions are to be used; and, as a general rule, he thinks it most prudent to resort to the latter after the third day of the stage of excitement. In this, however, we must be governed by the degree of arterial excitement, and of the heat of the surface present; for cold water may be safely and beneficially applied, at any period of the disease, provided the skin be very hot and dry.* (Dr. Stranger.) Purgatives and cold affusions may be employed conjointly. Armstrong, indeed, asserts, that when thus used they do more good than when employed separately, more especially during the first three days of the stage of excitement; and several instances have come under my own observation which strongly favour this opinion. *Blisters* may sometimes be beneficially used during the first two or three days of the stage of excitement. When the tonsils are much inflamed and swollen, so as to render swallowing difficult, the application of a blister to the throat will often afford considerable relief. This practice is particularly recommended by Willan, Heberden, and Rush.

When the disease is complicated with visceral inflammation, little or no relief will be obtained from the application either of cold or tepid water to the surface; and Armstrong observes, that where these measures in conjunction with purgatives do not afford any advantage, the practitioner may be sure that there is some latent inflammation present. When this is the case, and collapse is not approaching, recourse must be had to sinapisms, blisters, small general or topical abstractions of blood. Should there be manifestations of much vascular irritation, or of incipient inflammation of the brain—that is, should the face become flushed and turgid, with severe pulsating pain in the head, more or less delirium, intolerance of light, and a disposition to somnolency, the patient must be kept in a cool situation, with his head elevated, *and blood drawn according to the state of the pulse*,† an active purgative administered, warm fomentations, or sinapisms applied to the feet, and cold water to the head, and cups applied to the temples, or blisters to the back of the neck, provided always that collapse is not at hand. Unfortunately, however, the supervention of internal visceral inflammations in this affection is almost always speedily followed by *collapse;*

* Willan on Cutaneous Diseases—note at page 360.

† Armstrong; Marcus, (Specielle Therapie, tom. iii. p. 272;) Lorry, (Hist. de la Soc. Roy. de Méd. t. ii.;) P. Frank, (de Curand. Homin. Morbis;) Rush, Burserius, (Institut. Med. Pract. vol. ii. p. 72;) Heim, (Horn's Archiv. fur Medic. Erfahr. vol. iv. h. 1. p. 150.) Richter and other eminent authorities may be adduced in favour of prompt blood-letting in such cases.

and in this state, sanguineous and other evacuations are entirely out of the question. Dr. Armstrong observes, that "in such examples the question is simply this—whether is there greater danger to be apprehended from the inflammation or from the depletion?" Visceral inflammation, he says, almost invariably terminates fatally, but depletion produces debility only, and debility is rarely the cause of death. He is, therefore, of opinion, that an attempt ought to be made to arrest the inflammation by depletion, even in the stage of collapse, wherever it may be seated. It is true, that debility is perhaps rarely the cause of death; but it may be asked, why is visceral inflammation so fatal in such cases? The answer would seem to be:—*because it is connected with universal debility;* and the clear inference is, that whatever tends to augment this debility or prostration, must tend also to hasten its fatal termination. Before we adopt so desperate a practice, we should reflect that a small bleeding cannot materially influence or reduce the internal inflammation, and a large one must inevitably precipitate the patient into fatal prostration. Such cases are indeed exceedingly perplexing, for the remedies which are best, and almost alone calculated to remove the inflammation, are also the most certain to increase the prostration. When the brain is the seat of the inflammation, we may apply fomentations to the feet, dry cups to the temples and shaven scalp, and exhibit active purgatives conjointly with carbonate of ammonia, or camphor. In other visceral inflammations attended with collapse, I should be disposed to resort to calomel and opium, with dry cupping and large fomenting cataplasms over the region of the affected part. Blisters in such cases are almost as hazardous as bleeding. They produce much general irritation, and the blistered part often becomes gangrenous.

Malignant scarlatina, though generally strongly phlogistic in its commencement, passes so rapidly into a low and typhus state, that formerly physicians placed almost their entire dependence in its treatment, on the active and early employment of bark, wine, and other stimulating and tonic remedies. "These remedies," says Armstrong, "so forcibly, so indiscriminately, and so fatally recommended by numerous authors, were once the means upon which, unfortunately, I relied for the cure of this modification of scarlet fever; and from repeated trials of them, I can truly affirm that they are the most pernicious in the first stage, and the most destructive in the second." However rapidly this form of the disease may pass into a low and malignant state, its onset is often characterized by highly inflammatory symptoms. The attack is vehement, and the febrile excitement at first tumultuous, tending rapidly to consume the vital energies; and in proportion to the violence of this excited, though

transient stage, will be the tendency of the disease to assume a putrid character. It is therefore of the utmost importance to break down promptly, by energetic measures, the initial febrile commotion. I have already stated that the exhibition of an emetic, followed by a brisk purgative, in the chilly or forming stage, is often as beneficial in this as in the other modifications of the disease ; and the treatment should always commence with these remedies, if we are called at a sufficiently early period. If, after the operation of these evacuants, the stage of excitement begins with violent symptoms—such as intense heat of the skin ; severe headach ; delirium ; and a frequent, quick, and tense pulse ; blood should be promptly and efficiently abstracted. (Burserius, Lorry, Armstrong.) As this stage is generally but short, it is of great importance to draw blood at once in its onset, to the extent of producing a very decided impression on the system ; or, as Armstrong advises, until syncope approaches. By one such bleeding, and the brisk operation of a purgative, the violence of the disease is often broken down, and its subsequent course rendered milder and more manageable. It must not be forgotten, however, that these active depletory measures must be entirely restricted to the *early period* of the stage of excitement ; for when collapse is approaching, bleeding is wholly out of the question. (Armstrong.) Purgatives are always proper during the stage of excitement in every variety of scarlatina. *Calomel* has been particularly recommended for this purpose, both in the mild and the malignant forms of the disease.* Dr. Rush gave this article throughout the whole course of the disease. Seelig† speaks in high terms of a combination of calomel, precipitated sulphuret of antimony, and tart. antimony, according to the formula below,‡ a combination which is said to be particularly useful as a gentle laxative and antiphlogistic alterative in the present variety of the disease. In conjunction with purgatives we may use the *warm* bath with a prospect of advantage, more especially in cases attended with internal inflammation.

When a prompt and energetic antiphlogistic treatment is employed in the onset of the inflammatory form of malignant scarlatina, the system seldom sinks into a very low state of collapse;

* "It is somewhat remarkable," says Armstrong, "that calomel, though given in large and frequent doses, will hardly ever produce ptyalism in scarlatina." He states that he has frequently given from six to eight grains of this article to children, twice, thrice, and even four times daily, without having in a single instance known it to produce salivation. He considers it the best purgative in every modification of this disease.

† Hufeland's Journal, bd. 16. 1 st. Reil's Fieberlehre, vol. v. p. 177.

‡ ℞. Calomel ℈i.
Sulphuret. antimon. præcipit. gr. ii.
Tart. antimon. gr. i. M. Divide into twenty equal parts. Dose —one part to be taken every three or four hours by adults.

and when this stage supervenes after such a treatment in the commencement of the disease, we may, in general, give sufficient support to the vital powers by wine-whey, weak solutions of ammonia, infusion of serpentaria, a milk diet, quietness, and proper ventilation. (Armstrong.) When from an inefficient or improper treatment in the beginning, or from a peculiar violence of the disease, great and universal collapse ensues, (which is indeed but too frequently the result, both in the inflammatory and congestive modifications of malignant scarlatina,) recourse must be had to a more active, stimulating, and tonic treatment. The carbonate of ammonia in frequent and active doses;* wine; camphor and opium where the brain is not particularly affected; infusion of serpentaria, with strong doses of elixir of vitriol; quinine and capsicum, are the remedies upon which our dependence must be placed. The *capsicum* appears to be a particularly valuable exciting remedy in this variety of the disease. This article was first employed in malignant scarlatina by Dr. Stephenst in a very fatal epidemic which prevailed at St. Christopher's (West Indies) in 1787, and it has since received the decided approbation of many eminent practitioners.‡ The manner of employing it is as follows: take two table-spoonfuls of small red pepper, or three tea-spoonfuls of common Cayenne pepper, and two tea-spoonfuls of fine salt; beat them into a paste, and pour upon them half a pint of boiling water; this is to be strained, and half a pint of good vinegar added to it. Of this liquor, when cold, a table-spoonful is to be taken every half hour by an adult, and the throat should be frequently gargled with it. Stephens asserts that he employed this remedy in about four hundred cases, and with surprising success. The ulcers in the fauces soon cast off their sloughs and commenced to heal, a general pleasant warmth was diffused throughout the system, and the vital powers speedily resumed a more active condition. Malfatti§ speaks very favourably of the flowers of arnica; and Stieglitz employed them with much advantage in the sinking stage of the complaint. Reil strongly recommends large doses of musk, particularly where much restlessness and nervous irritation exists. Stimulating frictions with brandy, camphorated spirits, or tincture of capsicum, have also been found useful in the collapse of this disease.

* Peart asserts that he has been so successful with the use of carbonate of ammonia, that out of three hundred cases in which he employed it, he lost but three patients. This, however, may well be deemed, *ultra rem tendere*, in commendation of this remedy; although, unquestionably, a highly useful medicine in the stage of collapse, not only of this but of all forms of disease.—*Practical Information on the malignant Scarlet Fever*, &c., by E. Peart, London, 1802.

† Edinburgh Medical Commentaries, Dec. 2. vol. ii. p. 75.

‡ Cappel, loc. cit. p. 276, Kreisig, loc. cit. p. 113, and Seibert, archiv. fur die Volksarzneikunde, p. 129.—As quoted by Reil, loc. cit., vol. v. p. 175.

§ Hufeland's Journal, Bd. 12, st. 120.

(Reil, Stieglitz.) In the stage of excitement, cooling drinks acidulated with lemon-juice, or the sulphuric or muriatic acids, should be freely allowed; but during the subsequent stages, infusions of sage, balm, or catnep, with sulphuric acid, are more appropriate. In relation to the *congestive modification of the disease*, it is not necessary to say much in this place; for the principles of treatment are always the same in all congestive states of febrile diseases, and what has already been said of the treatment of congestive typhus, applies in all respects to the present malady when it assumes this modification. When the disease commences and proceeds under symptoms of oppressive internal venous congestions, our first efforts must be to recall the circulation to the surface, and to relieve the internal organs; and for this purpose, our reliance must be placed on the assiduous use of frictions, and warm and stimulating applications to the surface; large doses of calomel, (20 grains;) stimulating enemata; warm and gently stimulating ptisans, and small doses of camphor where the stomach is irritable. Having elicited a moderate degree of febrile reaction by these means, it will in general be most prudent to commence at once with the use of some of the milder stimulating remedies, such as infusions of serpentaria, calamus, wine-whey, or small doses of the carbonate of ammonia; and as the disease advances and the signs of prostration increase, the more active exciting remedies already mentioned must be employed, with an energy corresponding to the degree of prostration present.

Local treatment.—Various local applications have been recommended for the purpose of moderating the tendency to ulceration in the fauces, or of checking the progress of the ulcers, favouring the separation of the sloughs, and disposing them to heal. Willan strongly recommends fumigation with nitrous gas; others speak favourably of the application of a weak solution of nitrate of silver to the sores; and some recommend the sulphate of copper—all of which may, no doubt, be used with benefit. Various gargles also have been employed, and of these the infusion of Cayenne pepper, mentioned above, is perhaps the best. I have seen much good done in putrid sore throat by a strong infusion of the root of *baptisia tinctoria* (indigo plant,) and I have also employed the *black-wash*, (calomel gr. xx. lime-water ℥viii.) with excellent effect in several cases of this kind. Barley-water, acidulated with sulphuric or muriatic acid, forms an excellent gargle for washing off the acrid matter from the inflamed and ulcerated fauces. Where there is no visceral inflammation, or collapse has not supervened in the anginose variety, a gentle emetic will often have an excellent effect in cleansing the sores and clearing the fauces from viscid and offensive matter. "Emetics," says Armstrong, "are the best gargles, where the

throat is much obstructed from an accumulation of tenacious mucus; their operation effectually dislodges that morbid secretion for a time; often greatly relieves the respiration; improves the appearance of the ulcers; and they may be repeated where no abdominal inflammation exists, at any time, during the continuance of the fever, whenever the respiration and deglutition become much impeded by an accumulation of phlegm."

During convalescence from scarlatina, which is generally very tedious, a light and nourishing diet should be enjoined, and the patient carefully guarded against the influence of cold and variable weather. When there is considerable debility and relaxation present, mild tonic and cordial remedies should be prescribed, such as weak infusions of serpentaria, colomba, gentian, or calamus aromaticus, with some of the mineral acids, particularly the sulphuric. In some cases, more or less general irritation remains during the early part of this period. The pulse is quick and frequent, the skin pale and dry, the bowels inactive, the appetite weak, and the sleep disturbed. Here tonics and cordials are entirely out of place. Recourse must be had to mild aperients, diaphoretics, warm bathing, and a simple and unirritating diet. Small doses of calomel in union with ipecacuanha, (one grain of the former to two of the latter) three or four times daily; the muriate of ammonia; digitalis with the nitrate of potash; spiritus mindereri with minute portions of tartar emetic; infusion of eupatorium perfoliatum, or of elder blossoms; acidulated diluents, &c. will generally answer well in cases of this kind. In all instances, the patient should be particularly careful to avoid taking cold; and as the susceptibility to the injurious effects of low and variable temperature is always especially great immediately after an attack of this disease, he should remain within doors during the whole period of convalescence, unless the weather be mild or warm.

I have already mentioned dropsy as a very common consequence of every modification of scarlatina. This tendency to anasarcous effusion is generally ascribed to improper treatment during the febrile stage of the disease, or to errors in diet, or imprudent exposure to cold during the periods of desquamation or convalescence. That these causes have a particular influence in this respect cannot be doubted; but as dropsy sometimes occurs after the most judicious and careful management in all these respects, it would seem that the original disease itself tends ultimately to effusions of this kind, perhaps from not having passed regularly and completely through its specific train of morbid actions—the dropsy or some other disorder appearing afterwards as a complimental affection.* These dropsical affections are sel-

* Reil. loc. cit. vol. v. p. 186.

dom either obstinate in their course or dangerous. In most instances of dropsy from this cause, the general state of the system is manifestly phlogistic. The pulse is quick, sharp, tense, frequent, and sometimes full; the skin dry, harsh, and preternaturally warm; the urine small in quantity, high-coloured, and charged with coagulable serum; and the bowels generally torpid. Here an antiphlogistic treatment is evidently indicated. Richter strongly recommends blood-letting, and other eminent writers (and amongst these several recent ones) insist with equal emphasis on the propriety of this measure. Burserius gives an account of an epidemic scarlatina which prevailed at Florence in 1717. The disease yielded readily under the plan of treatment recommended by Sydenham. After the twentieth day from the commencement of convalescence, many became affected with a sense of weight in the chest, cough, œdema of the face and on the fore-part of the neck. Fever soon followed; the dropsical effusion increased until it became general; the breast felt sore; the abdomen distended and painful; the urine very small in quantity, and in some instances almost entirely suppressed. All who took diuretics died. On dissection, the lungs, kidneys, and intestines, were found inflamed. Blood-letting was now freely resorted to in the cases which occurred, and the result was uniformly favourable.*

Gregory seems to hesitate concerning the propriety of venesection in hydropic affections after scarlatina. He states that he has "met with several cases which appeared to indicate bleeding and purging, but which resisted both, and ultimately yielded to bark and aromatic confection." My own experience leads me to place confidence in this measure, where the diathesis is evidently inflammatory; not indeed as a sole or even a principal curative means, but as an important preparatory step to the employment of diuretics, purgatives, and diaphoretics. The best diuretic in cases of this kind is digitalis, either alone or in union with small portions of calomel and nitrate of potash. As a purgative and diuretic, I have derived much advantage in this and other varieties of phlogistic dropsy from the following combination.† Small doses of tart. antimon. dissolved in a large portion of some mucilaginous diluent, may also be used with advantage. Richter recommends large doses of calomel, from five to ten grains daily to children. The occasional use of the tepid bath will often prove beneficial, and the mildest farinaceous diet,

* Burserius, Institutiones Med. Pract. vol. ii. p. 81.

† ℞. Crem. tart. ℥i.
P. Sulphat. potassæ ʒiii.
P. scillæ ʒii.
Tart. antimon. gr. iss. M. S.—Give from twenty to thirty grains four or five times daily to an adult.

with cooling acidulated drinks, and quietude, should be enjoined. Sometimes these dropsical effusions are entirely without any febrile irritation, the system being relaxed, torpid, and leucophlegmatic;—the *hydrops frigidus* of the German writers (Reil). According to Richter, "the principal remedy in cases of this kind, is calomel in doses sufficiently large to evacuate the bowels freely."* The cinchona bark, and the various medicinal preparations of iron, particularly the black sulphuret, are often decidedly beneficial in this form of the disease. Among the diuretics, squill, spirits of turpentine,† and the tincture of cantharides, have been especially recommended. (Hufeland, Bucholz). The following mixture is said to have done much good in such cases.‡

Prophylactic measures.—In Germany, and in France, many statements have been published which would seem to prove that the *belladonna*, when regularly taken by those who are exposed to the contagion of the disease, will effectively protect them from the infection. Hannemann, the author of the homœopathic doctrine, first introduced this narcotic as a preventive of scarlatina, and in conformity to his views, he prescribes it in what may be called *infinitesimal doses*. He gives but forty drops in seventy-two hours, of a solution of which one drop contains no more than the twenty-millionth part of a grain of the extract! However incredulous we may be in relation to the efficacy of such doses, we are not without respectable authorities in favour of the prophylactic powers of this article when given in small doses. Berndt asserts, that he gave it with unequivocal advantage in this respect. Dr. Koreff of Berlin, found it to protect persons completely against this disease, when taken for eight or ten days before they were exposed to its contagion. Three grains of the extract are to be dissolved in an ounce of cinnamon water, and given in doses of from two to three drops to children under one year old, and one drop more for every year above this age.§

* Kreisig speaks equally favourably of calomel in this and other morbid consequences of scarlet fever. "Against the sequela of scarlatina," he says, "the powers of calomel are great, and cannot be too highly praised."—*Abhandl. über das Scharlachsfieber*, &c. p. 107.

† ℞. Spir. terebinth. ℥i.
Tinct. opii. gtt. L. M. S.—From ten to twenty drops may be given three times daily to children from five to ten years old.

‡ ℞. P. cinchon. ℥ss.
Aq. fervent. ℥xii. coque ad reman. ℥vi. dein adde,
Rad. polygal. seneg. ʒii.
Fol. digitalis, ℈i. cola. dein adde,
Spir. nitri. dulc. ʒii.
Syrup. cort. aurant. ℥ss. M. S.—Take from a tea, to a table-spoonful every two hours, according to the age of the patient.

§ Ed. Med. and Surg. Journ. Jan. 1825.

Seclusion of the sick, free ventilation, frequent changes of the linen, and other similar precautions, have been found completely effectual in preventing the communication of the disease to other members of the family. It does not appear that the contagious miasm of this disease is capable of attaching itself to clothes like some of the other exanthematous contagions. The breath of patients in the malignant form of the disease is said to be powerfully infectious; and the same has been observed with regard to matter discharged from the fauces.

Sect. VI.—*Erysipelas.—St. Anthony's Fire.*

Erysipelas is a febrile disease, attended with diffusive cutaneous inflammation on some part of the body, characterized by redness, burning heat, swelling, and vesication.

In the majority of instances, various symptoms of deranged health precede the appearance of the erysipelatous inflammation —such as lassitude; slight headach; loss of appetite; nausea; general depression; furred tongue; and a disagreeable feeling of weight in the epigastrium. These symptoms usually terminate in febrile reaction before the cutaneous inflammation commences; but in some instances the local and general affections come on simultaneously; and occasionally the inflammation appears before the febrile irritation is developed. Sydenham speaks of an erysipelas, in which the affection of the face preceded the fever.

The inflammation comes out in the form of an irregularly circumscribed stain or blotch, which soon spreads over a greater or less extent of the contiguous surface. When the inflammation is very superficial, the redness of the skin disappears, for a moment, on pressure being made with the point of the finger; but where the inflammation extends deeper, no white spot is left after pressure. Considerable burning and stinging pain, but neither pulsation nor tension, is felt in the inflamed part. Some degree of tumefaction always attends from the beginning, and increases, often to a very considerable extent, in the progress of the disease. After the inflammation has continued for an uncertain time, though usually about the third day, small vesicles, or blisters of various sizes, filled with a limpid or yellowish serum, make their appearance. On the succeeding day, and sometimes not until two or three days after, these vesicles break, and discharge a viscid fluid, which occasionally forms crusts or large scabs. When the inflammation is about terminating in resolution, which usually occurs between the fourth and sixth days, the redness of the affected part diminishes, and assumes a pale or brownish yellow colour; the swelling also begins to subside;

the skin acquires a rough and rugose appearance; and, on the following day, desquamation takes place. The general or febrile symptoms commonly follow the progress of the local erysipelatous affection, both increasing and declining together; yet, in their respective grades of violence, there is often no direct proportion between them, the fever being sometimes severe, with but a moderate local inflammation, and *vice versa*.

In some instances, the inflammation gradually travels along the skin, without increasing much in the extent of its surface, disappearing from the parts first affected, in proportion as it encroaches on the adjoining sound skin. La Motte gives the history of a case which commenced on the scalp, and in the course of three weeks, gradually travelled over the whole surface of the body.* Similar cases are related by other observers.† (Reil.) Occasionally, whilst it retains possession of the part first seized, it spreads more and more, until a large extent of skin, and in some rare instances the whole surface of the body, is erysipelatous. Salmuth, (cent. i. obser. 3,) relates a case of universal erysipelas. Sometimes the inflammation disappears from its original seat, and comes out on some other, and often remote, part of the body.

Such are the general phenomena of erysipelas. It is subject, however, to several prominent modifications, exhibiting important peculiarities, both in relation to the character of the local affection, and the nature of the attending fever.

The true seat of erysipelatous inflammation, appears to be in the *cutis*, or the *dermoid* system generally; and in its simple and regular form, it is, in a great measure, if not wholly, confined to this structure. When the inflammation is very active, and extends itself to the subcutaneous and intermuscular cellular structure, it assumes somewhat of the character of common phlegmonous inflammation, constituting the *erysipelas phlegmonodes* of authors. This state of the disease is characterized by a decidedly synochal grade of fever; the pulse being hard, tense, and frequent; a vividly red appearance, and an extremely distressing burning heat and prickling pain of the inflamed part; a dry tongue, with urgent thirst; and a tendency to profuse sweats. The swelling usually commences about the second day of the fever; and in a few days more, small vesicles appear on the inflamed skin. When the disease tends to resolution, these vesicles break or subside about the fifth or sixth day; the redness assumes a yellowish hue; the tumefaction and fever gradually decline, and by the eighth day, the old cuticle begins to desquamate. Frequently, however, instead of taking a turn to

* Chirurg. t. i. observ. p. 92.
† Ephem. Nat. Curios. Dec. ii. Ann. iii. ob. p. 171.

resolution, the pain becomes throbbing, at the same time that the redness diminishes, and more or less extensive suppuration of the ordinary phlegmonous character takes place.

Sometimes the inflammation extends deeply into the cellular tissue, and appears to commence simultaneously with the external or dermoid affection. In cases of this kind, the pain is always extremely severe ; the skin tense, and exceedingly painful on the slightest pressure; and the general phlogistic irritation vehement. "The termination, except from energetic treatment, is seldom in resolution ; the suppuration, which takes place from the fifth to the seventh day, though sometimes sooner, is accompanied with irregular chills ; the redness of the skin and the pain diminish, but the swelling increases ; there is much doughiness, and the part remains in that state for some time. In some cases, the pus remains for a long time before an opening is formed in the skin to give it vent, but in general it escapes either by a natural or artificial orifice, mingled with shreds of gangrenous cellular tissue. In these cases the course of the disease is ordinarily tedious ; sinuses are formed ; sometimes sloughing of the skin takes place to a considerable extent, and colliquative diarrhœa often carries off the patient, exhausted by the slow fever and great suppuration." (Cazenave.) In some instances, where cellular inflammation and suppuration take place beneath aponeurotic membranes, the symptoms become still more violent and distressing. In cases of this kind, "violet spots appear on the inflamed skin about the second or third day ; these spots increase rapidly, and become covered with vesications ; finally, small eschars are formed, which gradually fall off, and convalescence takes place under a greater or less degree of suppuration."

This variety of the disease is sometimes attended with strong symptoms of disorder of the biliary system, constituting the *erysipelas phlegmonodes biliosum* of some of the continental writers. Although not an uncommon modification, it has been but little noticed by the English writers. Mr. Copeland Hutchinson is, I believe, the only one who has given a particular account of it in the English language. There is, generally, much bilious vomiting in the commencement of this variety of the disease, and throughout its whole course the symptoms of biliary disorder are very conspicuous; the tongue is covered with a brown fur ; the tunica albuginea is tinged with bile ; and the skin generally exhibits a more or less icterode hue. The fever is of the synochus grade, and suffers very distinct evening exacerbations and morning remissions. The urine is small in quantity, and highly charged with bile ; and in many instances bilious diarrhœa attends.

Phlegmonous erysipelas may occur on any part of the body, but it most commonly appears on the extremities and face.

Bateman says that it most frequently occurs in the face ; but Cazenave states that it is most frequently observed on the extremities, and this accords entirely with my own observations.

In some cases, the erysipelatous inflammation is early accompanied by an œdematous state of the affected part ; and this is more particularly apt to be the case, when the disease attacks persons of a relaxed and leucophlegmatic habit, or in such as have suffered much from chronic disorders, or are habitually intemperate. It would seem that in cases of this kind, the capillary vessels of the cellular tissue are, at first, in a highly congested, but not inflamed condition, and that these vessels soon relieve themselves by pouring out serum into the cellular structure. This modification makes its attack more mildly, and is, upon the whole, less dangerous and distressing than the preceding variety ; although sometimes attended with considerable danger when it attacks the face. The inflamed skin is pale-red, or yellowish-brown, and is attended with but a moderate degree of heat and burning pain. The tumefaction does not increase so rapidly as in the phlegmonous state of the disease, and exhibits a smooth and polished surface, and pits when pressure is made with the finger. The vesicles are very minute, numerous, and but little elevated. On the second or third day after their appearance, they break, and give rise to thin dark-coloured scabs. When the disease attacks the face, the swelling often becomes so great as to close the eyes, and render the whole face exceedingly bloated, giving it the appearance, as Willan observes, "of a bladder distended with water." In this case, too, considerable vomiting sometimes occurs at an early period, and in the height of the inflammation, delirium and coma occasionally supervene, and death takes place under symptoms of cerebral oppression. This modification of the disease is usually denominated *erysipelas œdematodes.*

When the disease occurs in weak and nervous individuals, it is apt to assume a typhoid character, and is generally accompanied with low delirium throughout the greater part of its course. In instances of this kind, the inflamed part is of a dark or livid colour ; the vesicles are not numerous but large, and frequently terminate in gangrenous ulceration. Suppuration and sloughing of the cellular tissue usually take place, "producing little caverns and sinuses, which contain an ill-conditioned pus." This constitutes what is termed by authors *erysipelas gangrenosum.* In the year 1716, gangrenous erysipelas prevailed epidemically at Toulouse ; and a similar epidemic is said to have prevailed in France in 1130. (Reil.)

Infants are subject to a modification of erysipelas (E. neanatorum) of a very obstinate and dangerous character. It usually occurs soon after birth, and instances are related of children hav-

ing been born with blotches of erysipelatous inflammation, so far advanced as to exhibit vesications and spots of gangrene. (Richter, Bateman.) The inflammation almost always commences on the lower part of the body—particularly about the genitals, nates, and umbilicus, and gradually spreads over the abdomen, and along the back and inside of the thighs. In some instances, several parts are affected at the same time, without a confluence of the inflamed blotches. The inflammation begins by a small red spot, which rapidly spreads irregularly over a greater or less extent of the skin. The inflamed part swells considerably; is firm and extremely painful to the touch, and of a dark red or purplish colour. Large but thinly scattered vesicles appear, having inflamed livid bases, tending often rapidly to sphacelus. The disposition to gangrene is indeed always very considerable in this variety of erysipelas, particularly on the abdomen; when it affects the extremities, ulcerative suppuration is apt to ensue. Symptoms of intestinal and hepatic disorder are scarcely ever wholly absent. The alvine discharges are usually frequent, painful, and grass-green; in some cases there is constipation, with colicky affections. A jaundiced appearance of the skin, aphtha in the mouth, and acid ejections from the stomach, are very common in this disease. Its course varies from about seven days to three weeks. When deep incisions are made into the affected parts after death, a large portion of thin serous fluid issues,* and the skin exhibits a firmer and thicker structure than in the natural state. Meckel found the umbilical vein, together with the peritoneum, inflamed, and he was led, by this fact, to believe, that inflammation of this vein, occasioned by rude management in cutting and tying the umbilical cord, constituted the primary disease. This opinion has since been adopted by many, but its correctness as yet is by no means established. (Reil, Fieberlehre, b. ii. kap. 5, s. 329.) Richter observes, that this disease in its general character is never purely inflammatory, but always manifestly gastric and irritative.

There is another affection which appears to be very closely allied to the present one, if not in reality the same disease, and which is equally confined to new-born infants. This is the *induratio telæ cellularis*, an affection characterized by a peculiar hardening, consolidation, or induration of the cellular tissue. It is not often met with in private practice, but in some of the foundling hospitals of Europe it has been abundantly observed. The affected part becomes hard, incompressible, and tense; the skin so firmly adherent to the subjacent parts, that it cannot be pinched up, or in any way moved from its fixed position. Its colour

* Osiander. Denkwurdigkeiten, b. ii. st. 2, s. 370.—Neue Denkwurdigk. b. i. s. 56.

is violet, pale red, yellowish red, or yellow. It generally commences on the trunk, and gradually extends its circle, until, in some instances, the whole body becomes affected. The little patient cannot cry out; deglutition is often difficult, spasmodic, and occasionally impossible; the jaws are sometimes closed as in trismus; and in most cases, convulsive or tetanic spasms ultimately come on. Its course is always rapid—terminating often by the third day, and seldom continuing beyond the seventh. It is a most fatal malady. I have seen five or six cases, but no recovery. There is also an habitual and non-febrile form of erysipelas. It occurs in cachectic persons, in women of a leucophlegmatic habit labouring under menstrual irregularities, and especially in individuals affected with chronic visceral disease, *more particularly of the liver*. Habitual drunkards also are very liable to this form of the disease, no doubt from the hepatic disorder which is almost always ultimately produced by habitual intemperance.

Although erysipelatous inflammation most commonly terminates in resolution, yet suppuration and gangrene frequently occur in the more violent grades of the disease. There is something very peculiar, however, in erysipelatous suppuration, both with regard to the seat of this process and the character of the pus which is formed. It always commences in the subcutaneous cellular tissue, and the pus generated is very rarely thick, and yellowish like that in common phlegmonous suppuration, but thin, grayish or whitish, somewhat acrid and sanious. The matter is never collected in circumscribed cavities; it travels along the cellular tissue, under the skin, and between the muscles until this structure (cellular) is almost entirely destroyed in the affected part. Small openings finally ulcerate through the skin, and the matter, mixed with shreds of sphacelated cellular membrane, is discharged. Through these orifices large portions of deadened cellular structure may be drawn, "resembling pieces of wet tow." I have, in two instances, known this tissue so completely destroyed in the fore-arm, that the skin hung loose like a bag round the muscles, and the muscles themselves were completely separated, as if they had been dissected from each other. Both cases terminated fatally. In instances of this kind, that finally get well, the skin grows fast to the muscles, and even the muscles themselves adhere to each other, rendering their action very difficult, and sometimes destroying the free use of the limb entirely.

Erysipelas, of whatever variety it may be, is always more dangerous when it attacks the head than when it occurs on the body or the extremities. This arises chiefly from the brain being apt to become oppressed or inflamed in severe cases of the face. Instances occur, in which the inflammation passes down into the fauces and along the alimentary canal, giving rise to severe and

exhausting diarrhœa. Visceral inflammations of various kinds, have been known to supervene during the progress of severe erysipelatous affections. I have seen a case in which pneumonia came on during the height of the disease; and instances are related, in which the inflammation extended along the vagina into the uterus, as well as along the urinary passages to the kidneys.* (Frank.) The brain, however, is by far the most frequently affected in this disease. Does this arise from metastasis of the external inflammation? This point has been much disputed. Cullen ascribes the cerebral affection to the mere extension of the inflammation from the external part to the brain. This I believe to be correct. I have seen at least half a dozen cases in which symptoms of cerebral inflammation came on; but in no instance was the external inflammation in the smallest degree lessened by this occurrence. It is from the state of the brain, when the disease attacks the face, that we chiefly collect the prognosis. When neither delirium nor coma supervene, either before or during the presence of the inflammation, there is generally no cause to apprehend particular danger; but when these symptoms come on, the hazard is always great. I am by no means disposed to deny that erysipelas sometimes passes, by metastasis, from the external to internal parts—or perhaps, more correctly speaking, that visceral inflammation sometimes supervenes at the same time that the erysipelatous affection disappears. I have myself recently seen an instance of this kind. A lady became affected with erysipelas on both arms, occupying the whole surface from the hands to the elbows. On the third day the inflammation rapidly subsided, and on the following morning she was seized with alarming hæmoptisis. Richter observes that the *œdematous*, and what he calls *nervous*,† modifications of erysipelas, are the most liable to pass upon internal organs.

What I have hitherto said, has a reference chiefly to the local erysipelatous affection. In relation to the character of the attending fever, important diversities occur, which it may be proper to notice more particularly than has already been done.

The most common grade of erysipelatous fever is the *synochal*, or strictly inflammatory. In some instances, the fever, in its onset, manifests a typhoid tendency, but as soon as the inflammation appears, its synochal character becomes developed. More commonly, however, the fever begins at once in the character of a well characterized synocha; and this is more particularly apt to be the case in the *phlegmonoid* variety of the disease. In

* Reil, loc. cit., vol. ii. p. 372.

† He designates those cases by the term *nervous*, that are attended with a typhoid or typhus grade of fever. They are generally connected with manifest gastric derangements.

nearly all instances in which the inflammation attacks the face, the attending fever is of this grade; and it is of course always more apt to assume this grade in the young, plethoric, and robust, than in aged, infirm, and relaxed individuals. When the fever is synochal, it always increases in violence when the inflammation appears.

Not unfrequently the attending fever is typhoid, *ab initio*, and throughout. This is most apt to be the case in weak, nervous, and irritable subjects, and particularly in those who are affected with derangement of the digestive organs. Cases of this kind are always much more dangerous than where the fever is of a more active grade; for they are equally liable to the supervention of internal inflammations, and the occurrence of gangrenous suppuration is much more common in the former than in the latter, and of course, the system less capable of sustaining the effects of the disease.

Typhus, or as it has been called, malignant erysipelas, has occasionally prevailed epidemically. De Haen and Bartholini mention epidemics of this kind, and I have already referred to the epidemic which prevailed at Toulouse in 1716, which is said to have been but little less fatal than the plague.*

Cause.—In relation to the cause of erysipelas, nothing very definite can be said. Some individuals appear to be constitutionally predisposed to this affection; and Richter supposes that this predisposition depends on a peculiarly irritable and delicate condition of the dermoid system. In some persons, bruises, wounds, and other local irritating causes, are particularly apt to give rise to erysipelatous inflammation, and this is more especially the case in injuries of the scalp. The inflammation which is produced by the recent leaves of the *rhus toxicodendron*, is strictly of an erysipelatous character. Individuals of a cachectic habit; the habitually intemperate in diet and spirituous drinks; the leucophlegmatic; and persons labouring under chronic visceral affections, particularly induration of the liver or spleen, or mesenteric glands, are most liable to this disease. Strong and sudden mental emotion has been known to produce erysipelas. Richter observes, that he has known individuals who always became affected with erysipelas of the face, after they had been thrown into a violent fit of anger. (Therapie, bd. ii. p. 210.) In some individuals, erysipelas returns periodically. (Reil.) These cases are generally slight, and soon go off; and are usually dependent on some disorder of the liver or alimentary canal. Erysipelas seems at times to depend on some peculiar atmospheric constitu-

* Hippocrates mentions an erysipelas which spread among the people, and proved exceedingly fatal. The whole arm, leg, &c. had their soft parts in some instances almost entirely destroyed by gangrenous ulceration.—*Van Swieten's Comment.* vol. v. p. 181.

tion or miasm, for it is only to a cause of this general character that we can ascribe its occasional epidemic prevalence. Some writers of eminence assert, that the disease is sometimes propagated by contagion; and there are many facts recorded, which strongly favour this opinion. The disease has, for instance, been known to prevail to a great degree in certain wards of hospitals;* and Dr. Wells has brought forward some examples which occurred in private families, that appear to demonstrate its occasional contagious character.† Dr. Stevenson also, has recorded some facts of a similar import.‡ Its occasional apparent contagious character in hospitals may depend, however, merely on a general depraved habit of body, produced by the foul air to which the inmates of hospitals are at times exposed from deficient cleanliness and ventilation. Bateman states that this disease has been banished from the Royal Infirmary of Edinburgh, by ventilation and other means of purification.

Erysipelas occurs sometimes in the course of fevers, apparently from a critical effort of the system to relieve itself from some internal irritation. I have lately witnessed an interesting example of this kind. A person was seized with fever of a remitting synochus form. The disease was attended with symptoms of much gastric and biliary derangement. It continued without any amendment for nearly two weeks. At last a violent erysipelatous inflammation occurred on the face, which in the course of six days subsided regularly, and left the patient in a state of convalescence. This disease appears also at times on the suppression of some habitual evacuation. I know a gentleman in this city, who has been affected, for thirty years past, with an extensive superficial ulceration on one of his legs. Whenever the ulcer becomes dry, which generally occurs several times during the year, either an erysipelatous inflammation occurs on the face or the fore-arms, or he is seized with a violent fit of asthma. On the application of a blister to the leg, these affections speedily go off.

Treatment.—With regard to the general treatment of this disease, it is obvious that it must be modified according to the character of the attending fever; and that a course of remediate management, which might be very proper in one modification of the malady, would probably be very injurious in another. When the fever is of a high grade of reaction, the treatment should be antiphlogistic. It is not, however, often necessary, even in cases

* "The occasional contagious character which erysipelas assumes, is well known to all who have paid any attention to the complaint in the wards of hospitals."—*Dr. Johnson, Med. Chir. Rev.* October, 1826, p. 404.

† Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge, vol. ii. 1800. (Bateman.)

‡ Transact. of the Med. Chir. Soc. of Edinburgh, vol. ii. art. ix.

of this kind, to make frequent and copious abstractions of blood —unless symptoms of cerebral inflammation supervene, with an active state of the circulation. Under such circumstances, blood should be promptly and freely drawn, in order to relieve the brain. It does not appear, however, that any particular impression is often made on the progress of the erysipelatous affection itself—at least not on its obvious condition—by venesection ; although unquestionably frequently very useful in obviating some of the unfavourable consequences of the inflammation. When the pulse is frequent, tense, and hard, bleeding ought by all means to be practised, and carried to the extent that may be indicated by the state of the circulation, without any regard to the appearances or character of the local affection.

With regard to the propriety of local bleeding by leeches, very discrepant sentiments are expressed by authors. Willan, Thomson, Richter, and others, speak decidedly against this practice ; and from what I have myself seen of it, there appears to me much foundation for rejecting it. In the only case in which I have employed leeches, several very obstinate ulcerations occurred, apparently in consequence of the leech-bites. Cazenave speaks favourably of this mode of depletion ; but he very properly cautions against applying the leeches to the inflamed surface. It must be observed, however, that although some advantage may be derived from the application of leeches a small distance from the eruption, yet as the inflammation is apt to spread, this will not always obviate the evil consequences which are apt to result when they are applied to the inflamed part.

Purgatives are useful in every variety of the disease. When the disease attacks the face, they are particularly serviceable. In the ordinary phlegmonoid form, the saline purgatives are in general the best ; but where symptoms of gastric derangement attend, calomel, in small and repeated doses, assisted by an occasional saline aperient, is preferable. In the bilious modification, the exhibition of an emetic will often prove very useful. After the operation of the emetic, large doses of calomel should be given, until the bowels are freely moved. Reil says, that in cases attended with fever of a synochus, inclining to the typhoid grade, emetics are highly serviceable. "If the disease has continued for some days, and the more direct antiphlogistic remedies may no longer be deemed proper, and the inflamed part assumes a pale yellowish hue, and is somewhat œdematous, with but a moderate degree of heat and pain, emetics will generally arrest the progress of the disease effectively."*

The regular action of the cutaneous exhalents should be supported by diaphoretics of the refrigerant kind. The saline mix-

* Fieberlehre, bd. ii. p. 398.

ture, with a small portion of tart. emetic; spiritus mindereri, according to the formula mentioned at page 147; or the sal ammoniac mixture mentioned at page 95, will answer well for this purpose. Small portions of calomel and ipecacuanha in union, are peculiarly beneficial in this disease,* more especially in the erysipelas of infants. Throughout the whole course of infantile erysipelas, our principal aim should be to restore the regular actions of the liver, alimentary canal, and of the skin; and hence calomel and ipecacuanha, in the proportions just mentioned, with an occasional dose of magnesia or castor oil, and warm bathing, constitute, so far as my own experience enables me to judge, the most useful course of internal treatment in this variety of the disease.

When the attending fever is typhoid, direct depletion will of course be improper. In cases of this kind, bark and wine have been much recommended; and where the symptoms of prostration are great, it will be necessary to employ them actively. I have used cinchona in conjunction with the carbonate of ammonia, with much advantage, in a few cases of this kind. The quinine, however, would appear to be the best tonic in this modification of the disease. I have had occasion to prescribe it in but one instance of this kind, and its effects in this case were highly gratifying.

But although tonics and stimulants are essential in cases of a low grade of reaction, mild laxatives are almost equally necessary. The bowels are almost invariably loaded with irritating matters, which, if not removed, tend strongly to oppress and prostrate the powers of the system. In instances of this character, it will be proper to exhibit laxatives conjointly with stimulants, and to continue the use of the latter, during, as well as after, the operation of the former. In what is called the *gangrenose* modification of the disease, the fever always assumes a low grade in its progress, however active it may have been in its early stage. Where manifestations of approaching gangrene come on, or where this process has already commenced, wine, opium, camphor, *quinine*,† and the mineral acids, are the remedies upon which our reliance must be placed. Free purging, with active doses of calomel, in the early period of the disease,

* ℞ Calomel gr. ii.
Pulv. ipecac. gr. iii.
Sacch. albi. gr. xii. M. Divide into twelve equal parts. S. One to be taken every four hours by an infant.

† This article has of late years been much recommended, and deservedly so, in erysipelas of a typhoid tendency. Sir Astley Cooper, in his Lectures, gives the following, as, in general, the most successful mode of remediate management. "At first, give calomel, for the purpose of restoring the secretions of the liver and intestines, and the liquor ammoniæ acetatis, with antimony, to act upon the secretion of the skin, and then give the *sulphate of quinine*."

will, however, very generally render the necessity of tonics and stimulants in the latter stages, much less urgent than when this evacuation has not been sufficiently effected. It should always be recollected, in prescribing for febrile diseases, that intestinal irritation, from whatever cause it may proceed, has a powerful tendency to oppress or prostrate the vital powers; and that, under due precautions, the debilitating effects of purgatives are greatly exceeded by the increased energy imparted by the removal or diminution of such sources of irritation.

Should the inflammation terminate in suppuration and sloughing, opium and camphor, with quinine or cinchona, are indispensable in all cases. Opium is particularly valuable under circumstances of this kind, by allaying general irritation, and supporting the action of the heart and arteries. Opium may be given advantageously in combination with quinine; and in several instances of extensive suppurative ulceration in this disease, I have known much benefit derived from the extract of conium, in union with camphor, given at short intervals, in full doses. Upon the whole, however, bark or quinine in large doses, and opium, may be regarded as the most useful supporters in such cases.

Where the pain and irritation are great, opium, after proper evacuations, seldom fails to procure much relief. It should be given in full doses, at the same time that cold applications are made to the scalp and forehead.

When secondary inflammation occurs in some internal organ, recourse must be had to local and general bleeding, if the pulse remain sufficiently active; and in all such cases, cupping, sinapisms, blisters, and the other usual revulsives, are indispensable.

In cases attended with prominent cerebral disorder, such as delirium, coma, or insensibility, active purgatives and stimulating enemata are highly important means. For this purpose the *ol. terebinth.* has been found especially efficacious. Mr. Cox has given an account of a case of erysipelas of the scalp, face, and breast, which was attended with delirium, succeeded by coma and insensibility, with other symptoms portending a fatal termination; and which was successfully treated by the daily use of the turpentine combined with castor-oil, both by the mouth and per anum. This medicine brought away large offensive stools, and from the first dose the symptoms gradually subsided.*

Some diversity of opinion exists with regard to the propriety or usefulness of local applications to the affected part. Bateman observes, "that with respect to external applications in the early stages of erysipelas, experience seems to have decided that they are generally unnecessary, if not prejudicial;" and the same ob-

* Lond. Med. Repository, April, 1825.

servation is made by Cazenave and Schedel. My own experience has led me to a different conclusion. I have certainly never seen the least injury done by suitable applications of this kind; but, on the contrary, often the most decided benefit. Formerly, physicians were much in the habit of applying cooling or relaxing remedies to the inflamed surface—such as lead-water, cold water, emollient poultices, fomentations, &c. That such applications should prove useless, and often injurious, may be readily admitted. There exists a close analogy between the inflammation of erysipelas and that produced by a scald or slight burn. In both, the capillaries of the inflamed part are debilitated, congested, and passively distended, and in both, therefore, the best applications are such as are capable of exciting or stimulating these vessels to increased tone and activity. For many years I was in the habit of using a solution of corrosive sublimate, in the proportion of about four grains to the ounce of water, and generally with a satisfactory result.* Pieces of linen or flannel moistened with this solution, should be laid over the inflamed part, and renewed until the inflammation begins to subside. During the last four years, however, I have invariably used the nitrate of silver in solution, in the proportion of five or six grains to the ounce of water, and almost always with prompt and complete success. This solution is to be applied in the manner just mentioned for the sublimate wash. The mercurial ointment has been a good deal used in this country, as an application to erysipelatous inflammation.† I have myself employed it in several cases; in one, it proved very useful, but in the others, it afforded little or no advantage. It is to be applied by spreading it on pieces of linen, and laying them on the inflamed part. Dr. Brodie of London, from some experiments he made with this ointment, came to the conclusion that its good effects depended more on the adipose substance, than on the mercurial oxide combined with it, and in subsequent trials, he used only simple ointment, which in some instances, he says, proved quite as useful as the mercurial unguent. Lard has also been used in this city, and it is said, with considerable benefit. Brodie objects, and with justice, to the mercurial ointment, on account of its tendency to produce salivation; for in other respects, "its utility seemed unquestionable." Dr. Dewees also speaks favourably of this ointment, but makes the same objection to its use. Some of the English surgeons speak very favourably of an ointment, composed

* I learned the use of this remedy in erysipelas from Dr. Schott of this city.

† This remedy was first introduced to the notice of the profession by Dr. Dean of Harrisburg, although I have learned, that in the interior of this state, it was long before used in this affection by several respectable practitioners. Drs. M'Lellan and Lewis employed it before Dr. Dean became acquainted with its use.

of equal parts of ceratum calaminæ, ceratum saponis, and unguentum plumbi acetatis. In St. George's Hospital it has been used with evident benefit in traumatic erysipelas of the scalp.

Blisters applied to the inflamed surface, will often promptly arrest the progress of the inflammation. Dupuytren speaks favourably of this practice, and it has long since been a favourite remedy with many practitioners both in this country and in France. My own experience enables me to say very little of this application. I have resorted to it only in two cases; one of these terminated in extensive suppurative ulceration; the other was benefited by it. Blistering is said to be most useful where there is but a moderate degree of febrile reaction, with a moist and slightly red tongue, and a somewhat hot and tense skin. The blister must be laid directly over the inflamed part, and be large enough to extend a small distance on the sound skin.

Velpeau and Bretonneau recommend compression by bandages in phlegmonous erysipelas; and their statements do not permit us to doubt, that, in some instances at least, much benefit may be derived from this practice. When the disease affects one of the extremities, compression may be easily made; but in the face it is impracticable. It is only in the early stage of the complaint, before vesication occurs, that this practice can be advantageously or safely adopted. In a case which I have attended within the last eight days, I had a satisfactory illustration of the usefulness of this measure. Nevertheless, statements have been published unfavourable to this practice; and Cazenave apprehends, though apparently not from any experience, much mischief from it.

Several late English writers recommend making incisions though the inflamed skin and subjacent adipose and cellular textures. Mr. Lawrence, who strongly recommends this practice, asserts, that "these incisions are followed, very quickly, and sometimes almost instantaneously, by relief, and cessation of the pain and tension;" and a corresponding declension of the inflammation almost always takes place. Mr. Lawrence confines this practice to cases of the phlegmonous kind. Mr. Hutchinson also speaks decidedly in favour of making incisions into the erysipelatous surface. Mr. Lawrence recommends making one free incision, extending from one boundary to the other, through the centre of the inflamed part. Mr. Hutchinson, on the contrary, considers it better to make a number of smaller incisions, about an inch or an inch and a half in length, through the skin and cellular structure. Mr. Dobson, who likewise advocates this practice in a modified form, advises a great number of punctures to be made, a short distance from each other, over the whole disk of the affected part.

The experience of Mr. Plymsol, of the Glasgow Royal Infir-

mary, may also be cited in favour of this practice. "The practice of making incisions in erysipelas phlegmonodes," says Mr. P., "has been established in this infirmary for the last four or five years, and has invariably proved successful; long incisions are generally preferred."

That this practice is calculated to afford much relief in phlegmonoid erysipelas attended with a due degree of constitutional energy, cannot be doubted. The incisions or punctures give exit to the blood congested in the vessels of the inflamed part, and thus contribute directly and strongly to the reduction of the inflammation and its attending affections. In the other varieties of erysipelas—and even in the phlegmonoid form, attended with weak powers of vital resistance or a tendency to a typhoid condition, this practice is connected with considerable risk, from the tendency of the wounds to assume a gangrenous state. Some have indeed expressed much doubt as to the value or general propriety of this practice, even under apparently favourable circumstances; and several respectable writers speak decidedly against its employment.

Mr. James states, that in the cases in which he tried incisions, he did not obtain all the advantage which he was led to expect from Mr. Hutchinson's report of this practice. Several writers strongly protest against this measure, affirming that the wounds are apt to run into mortification. Mr. James did not find this tendency to mortification *so great* as some appear to apprehend.

CHAPTER XVII.

MINOR EXANTHEMATA.

Sect. I.—*Herpes.*

The term *herpes*, was formerly applied in a very vague manner; and the German writers still include under its head various chronic affections of the skin, which by the late English and French writers, are regarded as wholly diverse from each other.* Willan first employed it in a definite manner, and re-

* Richter arranges *ptyriasis*, *psoriasis*, *ecthyma*, and various species of *impetigo* with the herpetic affections. His fourth species, *herpes pustulosus*, comprehends the five varieties of herpes of Willan. The minute splitting of diseases, so common of late, may be regarded as of very doubtful advantage, both in a scientific and practical point of view. A careful comparison of many of these species —their variable character, and their frequent conversion into each other—shows

stricted its application to a distinct class of cutaneous affections, characterized by *an eruption of vesicles, appearing in groups or clusters on an inflamed surface, "so as to present one or more distinct spots separated from each other by intervals of sound skin."* In most instances, manifest constitutional disorder, such as languor, loss of appetite, restlessness, and occasionally febrile symptoms, with a burning or stinging sensation, or deep-seated aching pain in the affected parts, precede the appearance of the eruption. There is a regular increase, maturation, and decline, in the progress of the eruption, but the duration of its course varies from one to three weeks. The fluid in the vesicles is at first limpid, becoming opaque or whey-like and more viscid as the disease advances, and at last either concretes into brown crusts, or the vesicles break, and suffer it to escape, giving rise often to disagreeable and unmanageable ulcerations.

The diagnosis of herpes is founded on the assemblage of the vesicles in separate clusters, the red or inflamed state of the skin upon which they are seated, and the natural colour of the intermediate spaces of skin. These characteristics distinguish it sufficiently from erysipelas. From tetter (impetigo,) eczema, and other forms of chronic eruptions, it differs in its purely vesicular form, its more acute character, and particularly in the regular progress of the vesicles from their incipient transparent state to maturation, and finally scabbing.

Herpes admits of being divided into different varieties, according to the particular form of the vesicular clusters, and the part of the body upon which they appear.

1. *Herpes Phlyctenodes.*

This variety of herpes may occur on all parts of the body, having no determined form or seat. The appearance of the eruption is usually preceded, for several days, by slight febrile symptoms, and these sometimes continue after the vesicles have come out. On the part which is about to be the seat of the eruption, we may at first notice a multitude of very minute red points. In the course of twenty or twenty-four hours more, the skin upon which these points appear, becomes uniformly red, and small transparent vesicles make their appearance. The cutane-

at once the little foundation there exists for at least some of these subdivisions. The affections arranged under the term *herpes*, by Willan and others, are however sufficiently distinct in their character, and diverse from other analogous disorders, to require separate consideration; and it is of little consequence what name they bear, provided they are properly described and understood.

ous efflorescence extends a few lines beyond the margin of the vesicular group; and the vesicles themselves are firm and resisting to the touch during the first day. A sense of smarting, and occasionally a dull and severe pain, accompanies the appearance of the eruption—(Cazenave.)

The eruption most commonly occurs on the upper parts of the body, particularly on the neck, breast, arms, and cheeks. It consists of small transparent vesicles, aggregated into irregular clusters of various sizes, from a few to nine or ten inches in circumference. These vesicles are sometimes very minute, and at others they are as large as a small cherry. In some instances they come out at first on the neck or breast, "and gradually extend over the trunk to the lower extremities, new clusters successively appearing for nearly the space of a week." This gradual extension of the eruption occurs very rarely, however, except in cases where the vesicles are very minute. In general, the eruption is confined to one or two groups when the vesicles are pretty large. About the fourth or fifth day the vesicles either burst and give exit to the included fluid, or they begin to wither and concrete into yellowish scabs, which usually fall off about the eighth or tenth day, and leave a red and irritable surface. When the eruption appears in successive groups on different parts, the disease will of course be proportionably prolonged; for each cluster passes regularly through its stages of maturation and scabbing. However contiguous the groups of vesicles may be to each other, the intervening skin always retains its healthy appearance.—(Bateman.)

Diagnosis.—The only affection with which the present form of herpes is particularly liable to be confounded is *pemphigus;* but an attention to the circumstance that the vesicles in pemphigus are usually large, and always isolated—or at least not aggregated in clusters; and that they are very rarely attended with a red or inflamed basis, (unless where the bullæ are nearly in contact with each other) will enable us without difficulty to distinguish these affections.

Causes.—Children, and young and robust persons, appear to be most liable to this affection; but of its predisposing and exciting causes we have no definite knowledge. Cold, improper nourishment, or an excess of food, grief, watching, and irritation in the primæ viæ, have been supposed to exercise an agency in its development.

2. *Herpes Zoster.—Shingles, Zona.*

This disease bears a very close resemblance to erysipelas, and was generally regarded as a mere variety of this affection, until

Willan pointed out its distinctive characters, and placed it with the herpetic eruptions. This form of herpes is characterized by a band of vesicles, seated on a red or inflamed surface, commencing usually either in the right hopochondrium or lumbar region, and extending like a belt towards the fore part of the abdomen, without however crossing the median line. In some instances this band of vesicles passes down to the groin ; in others it passes upwards to the inferior angle of the scapula, and sometimes extends to the internal part of the arm, "running down occasionally to the cubital border of the hand." This eruption does not often occur on the left side of the body ; indeed I have seen but very few instances, of its location on this side. Velpeau,* and Brendel, however, assert the contrary. The former saw but one instance of its occurrence on the right side, out of thirty cases. The majority of writers, nevertheless, affirm that it generally makes its appearance on the right side, and my own experience is strongly in favour of this observation. It has never been found to occur on both sides at the same time. These vesicular zones are composed of irregular groups, from one to two or three inches in diameter ; and where the clusters are not very close to each other, the intermediate skin retains its healthy colour. The extension of the band does not occur by a regular succession of vesicles, but by successive new clusters coming out nearly in a line with the first. This, like the preceding variety of herpes, is generally preceded for a few days with loss of appetite, lassitude, slight headach, nausea, more or less febrile irritation, "together with a scalding heat and tingling in the skin, and shooting pains through the chest and epigastrium." In some instances, however, little or no constitutional symptoms can be perceived.† At first vividly red blotches appear arranged into an irregular belt, a short distance from each other. Upon these inflamed surfaces, a number of small whitish points appear, which soon increase in size, and become distinct transparent vesicles "of the size and appearance of small pearls." These vesicles increase in magnitude until the third or fourth day, when they acquire a yellowish or milky appearance, and on the following day begin to shrivel, at the same

* Revue Medicale, December, 1828.

† Cazenave and Schedel observe, "we have seen a great number of instances of zona in the Hospital St. Louis, and have never seen it accompanied with those general symptoms, and particularly of a gastric nature, with which it has been asserted it is always attended ; a state of uneasiness, in some rare cases a slight excitement of pulse, heat of the skin, a sensation of tension, which is generally painful about the seat of the eruption, acute pain in those parts where the disease terminates in ulceration, and finally a slight local pain, remaining some time after the eruption has disappeared, (not acute as has been said,) are the only phenomena, which, in a majority of cases at least, accompany this variety of herpes."—*Practical Synopsis*, p. 104.

time that their bases acquire a darker red, or bluish colour. The vesicles about this time break and discharge a viscid serous fluid which dries into brownish crusts, which fall off about the tenth or twelfth day. Sometimes excoriations and occasionally superficial ulcerations occur, leaving strongly marked cicatrices.

The disease does not, however, always pursue this regular course. In some instances the vesicles dry up about the fifth or sixth day—the fluid in them being absorbed—and terminate without scabbing, by desquamation. In old and enfeebled subjects, the eruption has been known to terminate in gangrenous ulceration of the skin.

Causes.—Zona is most apt to attack young persons;* and it is said to occur more frequently in males than females. (Bateman, Cazenave.) Reil asserts that this affection has never been observed in children under three years old. It seems occasionally to arise from the influence of cold; and some have ascribed its occurrence to irritation of the urinary organs. (Reil.) Disorder or irritation of the primæ viæ, and perhaps of the biliary organs, has appeared to me in some instances to be at the root of the disease. It is said to have prevailed epidemically. (Cazenave.)

Prognosis.—This form of herpes is but rarely attended with severe symptoms. When it terminates in ulceration it may become troublesome; and the occurrence of gangrene, which, however, is very uncommon, will of course be attended with more or less danger, according to its extent and the patient's constitutional vigour.†

Treatment.—The treatment of *herpes phlyctenodes* and *zona*, is to be conducted on the same principles. Gentle aperients, a simple and unirritating diet, and rest, will, in general, suffice for the constitutional treatment. When there is considerable restlessness, and some degree of febrile irritation, we may prescribe mild diaphoretics and cooling acidulated diluents. Where there is reason to suspect gastric or biliary irritation, minute portions of calomel and ipecacuanha will be proper. The warm bath will also be useful to allay restlessness and dispose to a regular action of the skin. Occasionally the arterial excitement is such as to warrant small abstractions of blood by venesection or leech-

* We often meet with perplexing discrepancies in the statements of different writers, on points, too, which are matters of mere observation. Thus, in the present instance, Reil's observations are directly opposed to those of Willan, Bateman, Cazenave, and others. "Of the *causes* of zona, we know at least that those who are most subject to it are old and cachectic persons, with a relaxed skin and visceral disorders." Fieberlehre, bd. v. p. 399. My own observations, however, lead me to the opinion expressed in the text upon this point.

† In relation to the prognosis of this affection, we find very different sentiments expressed by the old writers. Pliny, Lannge, Dr. Hoffmann, and Shulze, considered it as a dangerous disease; whereas Burserius, Vogel, Lorry, and Diel assert the contrary opinion.—*Reil, loc. cit.* vol. v. p. 400.

ing. Reil recommends particular attention to the renal functions, and advises diuretics where the urinary secretion is scanty. Where there is much deep-seated pain, we may use full doses of Dover's powder with benefit.

Bateman considers external applications unnecessary during its vesicular state ; and Cazenave asserts that "they are useless." My own experience has led me to a different conclusion. It is indeed true, that "saturnine and other similar astringent lotions" are of little or no service. I have, however, uniformly found the application of a solution of lunar caustic, in the proportion of six or eight grains to an ounce of water, when employed soon after the vesicles appear, to arrest the progress of the eruption, and cause desquamation in the course of three or four days at furthest; and sometimes much earlier. I have never known the slightest inconvenience to result from this practice. I keep this solution constantly applied to the affected part, by strips of linen or flannel saturated with it.* M. Velpeau, also, has expressed the most favourable opinion of the powers of this application, in zona. He affirms that when applied before ulceration has taken place, it never fails to arrest the progress of the malady, and so far as he has observed, always without unfavourable consequences.†

3. *Herpes Circinatus.—Ring-worm.*

This form of herpes is easily recognised by the annular arrangement of its small vesicles. It commences with slight redness and itching, succeeded by a circle of minute globular vesicles closely set together, which when closely examined are found to contain a colourless fluid. These coronæ of vesicles vary from an eighth of an inch to two inches and upwards in diameter, and the larger ones leave the central portion of the skin apparently in a natural state. The vesicles break in four or five days after their appearance, and are succeeded by little prominent, brownish, and thin crusts or scales, which in the majority of cases fall off about the eighth or ninth day, leaving a red surface which gradually disappears. Occasionally the whole disk of the circle is somewhat inflamed, "and a slight desquamation occurs without the formation of vesicles." When the circles are very small, the eruption withers, and gradually exfoliates without the formation of crusts or scales. Although the eruption is seldom protracted beyond the tenth day, yet in many instan-

* The lunar caustic was, I believe, first used as a local application in this affection, by M. Geoffroy.—*Revue Medicale*, April, 1820.

† Loc. citat, p. 435.

ces new circles of vesicles appear, in succession, so as to prolong the whole course of the disease for several weeks. The eruption is always attended with a troublesome itching and tingling sensation.

This variety of herpes is most frequently met with in children, and occurs generally on the arms, shoulders, breast, and especially on the neck and face.

This disease must not be confounded with a somewhat similar affection which occurs only on the scalp, (porrigo scutulata,) and which is familiarly known by the term *hair-worm*. This disease is contagious, destroys the hair, and is pustular. Its duration is indefinite and long, and it gives rise to the formation of thick adherent scabs.

There is a variety of ring-worm, not noticed in the work of Cazenave, though described by Bateman, which is by no means uncommon in this country, and which often continues for many months, and at last takes up a large extent of surface. It commences with a small circle of vesicles, like the form just described. This circle, however, gradually enlarges its circumference, by the successive appearance of new vesicles around the external margin of the ring, whilst those situated on its internal margin heal and desquamate.

Treatment.—The treatment is almost exclusively local.—Alkaline washes, such as a lotion of from one to two drachms of subcarbonate of potash or soda to a pint of water; or solutions of nitrate of silver, sulphate of zinc, or of copper. One of the best applications I have met with in this affection, is an ointment made of the root of the common narrow-leafed dock, (*rhumex crispa*) by boiling the grated root in lard. Mild laxatives should be used if the eruption is extensive.

4. *Herpes Labialis.*

This is a vesicular eruption which occurs on the upper and under lips, and particularly at the outer angle of the lips, extending sometimes nearly round the mouth, and occasionally to the cheeks, alæ nasi, and chin. In some instances this eruption appears almost suddenly, without any previous redness or disagreeable sensation in the part; and at others it is preceded by slight tenderness or pain, inflammation, and swelling of the skin, for three or four hours. The lip generally becomes somewhat swollen, hard, stiff, and tender. The vesicles sometimes "attain the size of a small pea, and are filled with a transparent fluid," which soon becomes opaque, acquiring a straw-colour, or sero-purulent appearance, during the third or fourth day. In the course of a day more they shrivel, and are succeeded by light-brown scabs,

which usually separate on the seventh or eighth day. This eruption is always attended with very considerable heat and smarting, and great soreness to the touch.

This variety of herpes does not often occur as an idiopathic affection. It generally appears on the subsidence of slight febrile affections from cold, as well as on the declension of other acute diseases, more especially such as are connected with visceral affections. It may in fact be considered, in cases of this kind, as a phenomenon of crisis, for it is a common, and in general not an incorrect observation, that the occurrence of this eruption indicates the near approach of convalescence. In many instances it is accompanied by coryza, and pain or tenderness in the fauces. It may be produced by irritating applications to the lips.

The only remediate applications necessary in this affection, are such as palliate the burning heat and pain, when these are troublesome. For this purpose, fomentations, with a decoction of white poppy heads; or cold water, with a small portion of acetate of lead dissolved in it, may be used.

5. *Herpes Preputialis.*

This variety of herpetic disease, occurs on the prepuce, and may readily be mistaken for chancre, to which indeed it sometimes bears a very close resemblance. It begins with one or more red spots, attended by itching, and a sense of slight heat in the part. Small vesicular elevations soon appear on these inflamed surfaces. When the eruption occurs on the external surface of the prepuce, the vesicles dry up about the sixth day, and are converted into small, firm scabs, which usually fall off by the end of the ninth or tenth day, and leave the skin underneath sound.

When the eruptions occur on the internal surface of the prepuce, they generally break about the third or fourth day, and form small scales, which soon separate and leave excoriations, passing sometimes into superficial ulcerations, with white bases, and slightly elevated edges. If left to themselves, or not irritated, these sores continue nine or ten days before they begin to heal, but when they once commence this process, they usually cicatrize rapidly.

This affection may arise from the prepuce being chafed by woollen clothing; from the irritation of morbid vaginal discharges; and particularly from suffering the natural secretions of the part to remain between the glands and prepuce.

Treatment.—I have generally employed a solution of borax with much advantage in this affection. When the excoriations

are slow in healing, a very weak solution of the nitrate of silver is perhaps the best application. I have used this solution in a number of cases with prompt benefit. The chlorite of soda in solution is likewise a very efficacious application in cases of this kind. I have lately employed this lotion in two obstinate cases with marked success. It was first recommended by Lisfranc. I used this article in the proportion of twenty grains to an ounce of water, and applied it five or six times daily.

Sect. II.—*Pemphigus.**

The term *pemphigus* is used to designate a peculiar exanthematous affection, characterized by fever, followed in the course of from one to three days with large transparent vesicles, having red and inflamed bases. The occurrence of such a disease, as an independent or idiopathic affection, has been much doubted by many writers, and some have even denied its existence altogether. Willan, Bateman, Plumbe, Reil, and a number of other writers, contend that the cases which are described by the earlier writers as acute idiopathic pemphigus, were—typhus, pestilential, or other *milder* forms of fever, attended by bullæ, as mere casual symptomatic and unessential eruptions. Gilbert,† and Biett,‡ on the other hand, admit the occasional appearance of acute pemphigus, as an idiopathic malady. There can exist but little doubt that many of the cases described by authors as *pemphigus*, were, in relation to their vesicular character, purely symptomatic; for bullæ entirely similar to those which are ascribed to this affection, have been known to occur in diseases obviously diverse in their general essential characters. They have occurrred in intermitting fever;§ in bilious remittents;‖ in dysentery;¶ in typhus;** in various modifications of malignant as well as in *arthritic* fevers;†† in hysteric affections;‡‡ and in the ordinary catarrhal

* The first distinct account that was given of this disease, is to be found in the writings of Piso (observ. 149) and Morton (tract. de morb. acut.) It has since been described under a great variety of names—such as, *febris catarrhalis vesicularis*, (Delius. amœnitat. med. dec. 1;) *febris vesicularis*, (Macbride and Selle, prax. medic. t. 11. c. 18;) *febris pemphygodes*, (Seeliger, Ephemer. N. C. dec. 1, ann. viii. ob. 56;) *febris phlyctenodes*, (Burserius;) *hydatides*, (de morbis a colluvie serosa orta;) *febris bullosa*, (Brugmann.)

† Monographie sur le Pemphigus.

‡ Cazenave and Schedel. Pract. Synop. of Cutan. Diseases.

§ Branne. Versuch über den Pemphigus, &c. Leipzig, 1795.

‖ Salabert. Abhandl. für pract ärzte, vol. xiii.

¶ Bontius. De Medic. Ægyptiorum. Rengger. Museum der Heilkunde, Zurich, 1794.

** Medecine Experimentale.

†† Hufeland's Journal, vol. xi. p. 138.

‡‡ Frank. Epitome, tom. iii. p. 269.

fevers, as well as in various other forms of febrile disease. Cazenave states that he saw a case in the Hospital of St. Louis, in which "this eruption was attended not only with gastro-intestinal irritation, but also with a pulmonary catarrh, an ophthalmia, and a very acute inflammation of the urethra. All these symptoms, together with the eruption, disappeared in the course of a month." It is difficult to conceive upon what grounds he regards this as a case of idiopathic pemphigus; for in its general course and phenomena it is greatly at variance with his previous description of this affection. Most assuredly, if this case deserves to be regarded as an instance of pemphigus, we may with little hesitation admit the many supposed examples of this disease, which have been reported by different writers (but rejected by Cullen, Willan, Bateman, and Reil) as genuine, though modified instances of this affection. Under this perplexing contrariety of statements and opinions, it is no easy matter to come to any satisfactory conclusion on this head. That the appearance of bullæ, or large distinct vesicles, in febrile affections, is often casual or symptomatic, and sometimes apparently critical, is unquestionable;* but it is nevertheless difficult to deny, merely from this general fact, that they may appear in an acute form as an idiopathic or independent malady. Whether, however, this eruption be always, or only generally symptomatic, I shall now describe it, as it has been observed and recognised for genuine acute pemphigus, by several recent writers, who must have been fully acquainted with the doubts expressed on this subject by Cullen, Willan, and others, and who, we may therefore presume, were better prepared to estimate the character of the disease than the earlier writers.

Pemphigus appears under two distinct forms: the *acute* and the *chronic*. The latter form is described by Willan, Bateman, and other late writers, under the name of *pompholix*.

Symptoms of acute pemphigus.—The disease commences with symptoms of general indisposition, or more or less febrile irritation. In some cases, the precursory symptoms amount only to a feeling of general languor and uneasiness, with slight acceleration of the pulse, and itching of the skin. In others, nausea, loss of appetite, slight chills, increased thirst, and great frequency of the pulse, with a hot and burning skin, precede the eruption. At an indefinite period from the commencement of these symptoms—varying from one to four days—the eruption makes its appearance. At first, small red circular spots come out, which speedily increase in size, each one becoming covered with

* Frank saw an instance of inflammatory fever, in which, after the fifteenth venesection, a critical pemphigus broke out.—*De Curandis, Hom. Morb.* L. 111, p. 265.

a transparent vesicle. These vesicles or bullæ are of a circular form, and vary from the size of a pea to that of a large hazelnut. Sometimes the bullæ are much smaller than the red spots upon which they are seated, leaving a considerable inflamed margin around their bases; at others, they cover nearly the whole surface of the circular spots, with only a very narrow line of red border. Cazenave and Schedel seem to regard these red areolæ or bases as invariably present and strongly characteristic of acute pemphigus. Richter, however, observes, that the bullæ sometimes appear to rise out of a sound skin, without the least redness around their bases. Some spots occasionally appear on the skin which do not vesicate; but to the touch they will be found slightly elevated, "and when they are rubbed for a short time, the cuticle becomes detached, and a slight exudation of serous fluid takes place under it."

The bullæ increase in size during the first twenty-four hours, and the contained fluid, at first limpid, becomes yellowish, and finally turbid.* They sometimes break on the second day; but much more commonly they remain in a turgid state to the end of the third or beginning of the fourth day, when the fluid begins to be absorbed, and the vesicles shrivel, leaving either thin brownish crusts, or only "small dry white epidermic lamellæ," which in a few days longer separate, exposing pale red surfaces.† If the bullæ are broke at an early period, they sometimes rise again, but more frequently superficial suppurative ulcerations ensue. (Richter.)

The occurrence of the eruption has no manifest influence on the general symptoms, the fever continuing usually without any obvious change until the bullæ begin to wither. (Richter.) The eruption may come out on any part of the body, and either occupy only a particular region, or appear scattered over the greater part, or the whole surface of the body. In most instances, however, the bullæ are confined, at first to a single part; when these begin to disappear, another crop comes out on some other portion of the body; and in this way, two or three successive eruptions may take place, so as to protract the whole course of the disease, sometimes to a period of between two and three weeks. The internal mucous surfaces, also, are liable to become affected,

* This fluid has been noticed acrid or irritating, like the tears in violent catarrh. Occasionally it is reddish, as if a small portion of blood were mixed with it. Very generally, however, it is perfectly bland and unirritating, at least in the early period of the eruption.—*Richter, Specielle Therapie*, bd. ii. p. 604.

† The spots left by this eruption are said to be peculiar. "We have several times seen M. Biett draw a diagnosis from them as to the previous existence of bullar eruption, which had been cured some time before. They are of a dull red colour, separated from each other, of an irregular form, of variable size, and form slight exfoliations from time to time."—*Cazenave and Schedel, l. c.* p. 129.

particularly the mouth, fauces, and œsophagus, and probably the mucous membrane of the alimentary canal.

The *pompholix solitarius* of Willan, is, according to Cazenave and Schedel, a mere variety of acute pemphigus. This is an extremely uncommon form of the disease, and may assume a more or less chronic character, although its usual duration is from eight to ten days.* Willan says that it seems to be entirely confined to females. A sensation of tingling of some portion of the skin is at first felt; this is succeeded by one large vesication, (appearing usually at night,) which is rapidly filled with a transparent colourless lymph. This large bulla breaks in the course of forty-eight hours, and leaves a superficial ulceration. In a day or two a second vesication occurs near the first one, which runs through the same course; and a third or even a fourth one may rise in succession, so as to protract the disease to the ninth or tenth day. (Bateman.)

Chronic pemphigus.—Willan and others who deny the existence of acute idiopathic pemphigus, describe the present variety of the disease as a distinct affection, under the term *pompholix.* They assert that the bullæ appear "without any inflammation around them, and without fever." This, says Richter, is not entirely incorrect. In many cases the disease commences with distinct febrile symptoms, which continue occasionally until the first eruption is completed; and in some instances the slight fever reappears afterwards, whenever a new and numerous eruption of bullæ is about to take place.† In almost all cases, the patient experiences a slight degree of lassitude, pain in the limbs, and languor, for several days previous to the appearance of the eruption. Nor does the observation that the bullæ are always "without any inflammation around them," appear to be correct, for in some instances "the secondary eruptions have erythematous areolæ." (Cazenave.) The bullæ begin by small red elevated points, on the centre of which the epidermis becomes speedily raised. These rapidly enlarge "into irregular vesications, acquiring often in a few hours the size of a hazelnut or even a walnut." If they do not break, they begin to shrivel about the third or fourth day, the fluid contained acquiring a reddish and opaque appearance. In a few more, the withered and macerated cuticle dries into thin brownish crusts. If the bullæ break at an early period, "the cuticle shrivels, or becoming partly detached, rolls up and lays bare a portion of the inflamed surface," or

* Cazenave, Synopsis, &c. p. 124.

† Specielle Therapie, bd. ii. p. 613. Reil says that in some cases the febrile symptoms are conspicuous in the commencement, but that these gradually subside, leaving only a chronic *bullar* eruption, which continues often for many months, and even years. Loc. cit. p. 428.

separates entirely, and exposes a painful superficial ulceration. (Cazenave.)

This affection is generally very tedious in its course, and may continue for several years. A continual succession of bullæ occurs on different parts of the body, sometimes in successive crops, and at others in such a manner, that, at the same time, some will be just appearing, others will be large, and distended with a straw-coloured lymph, and others again shrivelling, or already converted into small crusts. Occasionally the bullæ are so numerous that many of them run into each other, and in this case some of them usually become purulent, and on drying up leave thin yellowish crusts extending over a considerable portion of the body.

When the eruption is moderate, the patient does not in general experience much inconvenience from the disease; but in cases attended with numerous vesications, and particularly where the lymph is somewhat irritating, a burning and extremely distressing itching is experienced, which in violent cases sometimes obliges the patient to keep to his bed.

In some instances the vesicles are early attended with severe burning pain, become filled with a *red* acrid humour, and terminate in superficial suppurative ulcers, which heal very slowly. Reil observes, that bullæ, containing bloody lymph, occur only about the ears, where previous vesicles have already occurred.* Wichmann relates a case, in which, nine months after the commencement of the disease, he found the patient extremely tormented and debilitated by a great number of large ill-conditioned ulcerations on the lower extremities and sacral region. The ulcers appeared red, and the surrounding skin as if it had been scalded with hot water.† A somewhat similar case is mentioned by Cazenave and Schedel.

This affection may occur simultaneously on every part of the body; but in most instances the vesications are confined to a particular space. In the palms of the hands and soles of the feet they occur but very rarely. They have been observed on the internal surface of the mouth, the fauces, œsophagus, and the alimentary canal; in these situations they soon assume the appearance of aphthæ. The tongue and fauces occasionally become excoriated in cases of this kind. Colic; constipation; bloody and mucous alvine discharges; nausea; vomiting, or hæmatemesis, have been known to supervene in cases where the disease affected the alimentary canal. (Wichmann, Reil.) "At times, it would seem as if the eruption on the external and internal surfaces alternated—the symptoms of the latter increasing as

* Fieberlehre, Bd. v. p. 418.

† Beitrag zur Kenntniss des Pemphigus.

those of the former decrease, and *vice versa.**" Both Wichmann and Braune relate cases in which the mucous membrane of the bronchiæ became affected during the progress of this malady. Several instances are mentioned in which cough and purulent expectoration came on.

Cause.—Of the etiology of pemphigus there is as yet but little known of a satisfactory or definite character. It is said to be more common in old than in very young individuals, and in women than in men.† Braune supposes that this affection is frequently dependent on deficient or disordered urinary secretion; (l. c. p. 59.) Habitual deficiency of this secretion, and obstinate chronic cutaneous disorders, are indeed not unfrequently associated affections. In one of the instances of chronic pemphigus mentioned by Braune, the intimate connexion between the action of the kidneys and the cutaneous affections was manifested in the clearest manner. Whenever the urine flowed freely, the bullæ disappeared; but they invariably re-appeared when this secretion became scanty, watery, and muddy. Renal calculi were discharged from time to time with the urine. Richter, Wichmann, and Reil, also admit the frequent occurrence of renal disorder in pemphigus. It would seem also that disorder of the liver is a frequent attendant on this disease,—whether as cause or effect, is not known. Biett, in his dissections in the Hospital St. Louis, several times met with structural disease of the liver, in persons who had died under this disease. (Cazenave.)

The irritation of dentition; neglect of personal cleanliness; a deficient and coarse diet; habitual exposure to a damp atmosphere; and chronic visceral affections, would seem sometimes to favour the development of the disease. It arises, however, often, without any perceptible cause, either predisposing or exciting. It is said to have occurred endemically. The same individual may be affected with it several times, at distant intervals. This disease is not contagious. Hall inoculated with lymph taken from the bullæ without effect.‡

Diagnosis.—Acute pemphigus is liable to be confounded with *rupia simplex*, *ecthyma*, and *herpes phlyctenodes*. From the first of these affections it differs, by the bullæ in *rupia* being few in number, and followed by ulcerations, upon which thick and projecting scabs are formed. It is distinguished from the second by the bullæ in *ecthyma* being less elevated, and filled with a purulent fluid, having a brownish spot in the centre of

* Braune. Versuch über den Pemphigus und das Blasenfieber. Reil, l. c. p. 420.

† This at least is in conformity with the observations of Reil and others. Cazenave, on the contrary, says that the chronic form of the disease "rarely occurs in women."

‡ Duncan's Annals of Medicine, for the year 1799.

each. From the last disease it may be distinguished by the vesicles in *herpes* always appearing in clusters seated on a *diffused* red and inflamed surface. Although several bullæ in pemphigus are occasionally found collected in one or more groups, yet distinct bullæ appear elsewhere on the body, which is not the case in herpes.

Prognosis.—The acute form never terminates fatally unless dangerous secondary affections supervene. In relation to the probable duration, ultimate violence, and obstinacy of the chronic form of the disease, the prognosis is in general very uncertain. Some cases continue moderately for eight or ten weeks, and then disappear; others, apparently equally mild during the first four or five weeks, gradually acquire more and more severity, and continue for many months in an aggravated and very distressing form, and may even terminate fatally. The degree of danger depends, of course, in a great measure, on the extent of the eruption, the obstinacy of its progress, the nature of the visceral affections with which it may be complicated, and the degree of constitutional vigour of the patient. When the vesications assume a livid or bluish appearance, there is much reason to apprehend unfavourable consequences. (Reil.) Old, worn down, relaxed, arthritic, and nephritic subjects, are most apt to suffer severely from this affection.

Treatment.—In *the acute form of the disease*, it will in general be sufficient to put the patient on a simple and unirritating diet; to prescribe an occasional mild laxative; cool acidulated diluents; rest; and to avoid a humid and variable atmosphere. If inflammatory symptoms supervene, or the eruption is very extensive, a more active antiphlogistic treatment is required. Gentle purgatives; the ordinary saline diaphoretics, particularly the alkaline effervescing draught (potio Riverii;) tepid bathing; and venesection, must be used with an energy corresponding to the degree of the general and local inflammatory excitement present. Richter recommends calomel in such cases above all other aperients. He also advises the use of diuretics, if the disease manifests a disposition to continue beyond its ordinary course—and of these, he says, digitalis is the best, squills being, according to his experience, objectionable. All local applications must be avoided, nor should the vesicles be disturbed or opened. Cazenave recommends the application of leeches to the anus.

In *chronic pemphigus*, (*pompholix*,) we should in the first place endeavour to ascertain whether any visceral or other general disorders co-exist, or preceded the eruption. Should there be grounds for presuming the presence of a syphilitic taint, or of an arthritic or calculous diathesis, or finally of hepatic or some other visceral affection, recourse should be had to remedies suited to counteract the lurking affection. (Richter.) In general, a

moderately antiphlogistic treatment—such as acidulated diluents, mild aperients, and tepid baths, will be proper in the commencement. The German writers speak very favourably of the employment of diuretics in this variety of the disease. They are particularly indicated where the urinary secretion is scanty or unnatural. Richter says that he cured an inveterate case in a short time by the following mixture,* in conjunction with the free use of an infusion of juniper berries. The same writer recommends *dulcamara*, in union with *antimony*.† Lime-water in large portions; infusions of herba jacea; sarsaparilla; precipitated milk of sulphur; belladonna; and opium, have all been mentioned as remedies in this affection. I have met with but one case of chronic pemphigus. It continued for six months, under various modes of treatment, and at last disappeared under the use of Fowler's arsenical solution. When diarrhœa, with more or less obtuse abdominal pain, supervenes, opium is particularly serviceable. When pulmonary irritation occurs, attended with frequent and violent cough, spitting of blood, and oppressed respiration, local and general bleeding becomes necessary, after which opium and calomel may be administered with benefit. When, by the long continuance and severity of the disease, the strength of the patient is exhausted, or when the disease occurs violently in old, relaxed, and worn down subjects, quinine, with the sulphuric acid; a nourishing diet; occasional opiates; chalybeate preparations; and other supporting remedies, should be employed. Cazenave and Schedel state that they have observed several examples in the Hospital St. Louis, of the very good effects of tonic remedies even in young subjects, where the eruption was of long continuance.

Sect. III.—*Urticaria.—Nettle-rash.*

The nettle-rash, a very common cutaneous affection, is characterized by hard elevations of the cuticle, of irregular forms, with a pale or whitish centre, and generally a diffuse redness

* ℞ Extract. digital. purpur. gr. iii.—iv.—vi.
Submuriat. hydrarg. mitis gr. i.
Opii. puriss. gr. ss.
Sacch. albi. gr. xv.
M. Divide into twelve equal parts. S. Take one three times daily. The proportion of digitalis should be gradually increased. If the gums become affected, the use of the medicine must be suspended for a while.—Loc. cit. p. 615.

† ℞. Antimon. crud. nigri.
Pulv. stipit. dulcamar. āā ʒi.
Extract. trifol. aquat. ʒii.
M. Divide into two grain pills. S. Take ten three times daily.

round their margins, attended with intolerable itching, and a stinging or smarting pain.

Its course is often very rapid, the eruption appearing suddenly, and vanishing again in the course of a few hours; although in such cases, it usually re-appears for several days in succession. It may also assume a chronic character, and continue with occasional transient intermissions or remissions for many months, or even years.

Urticaria febrilis.—Symptoms of general indisposition, such as nausea, languor, drowsiness, slight chills, headach, anorexia, pain and anxiety in the epigastrium, with an accelerated pulse, precede the appearance of the eruption. At first, a general itching with a feeling of tingling heat is felt over the whole body; to relieve which, the patient is apt to rub or scratch the skin, which never fails to bring out, almost instantaneously, large patches of red elevations or *wheals*, with whitish central disks and irregular crimson areolæ, attended with an extreme degree of itching and tingling. The eruption speedily becomes more or less extensively diffused over the surface, particularly on the palmar aspect of the fore-arms, around the knees, along the loins, on the inner part of the thighs, and on the shoulders. The eruption vanishes irregularly on different parts of the body, but is almost immediately recalled "on any part of the skin, by strong friction or scratching." During the day the eruption subsides, but as the evening approaches, it returns, together with slight febrile irritation; and in this manner the disease is usually protracted to the sixth or seventh day, before it finally subsides. The parts principally affected become swollen and uniformly red; but the swelling always soon subsides after the eruption disappears. More or less languor and febrile irritation accompany the disease throughout; "the disorder of the stomach, however, is relieved by the appearance of the eruption, but returns whenever the eruption re-appears." (Bateman.)

Urticaria evanida.—This variety of the disease is unattended by fever, and often continues for many months under a succession of transient wheals, appearing here and there on the body, and vanishing again in a few hours, at short and irregular intervals. An eruption will perhaps appear on one arm in the morning, and disappear again in a few hours; in the afternoon, the wheals may come out on the legs and remain for a short time; and after a short interval, or only on the following morning, they may appear on the body. In this way the disease may go on to a very protracted period—the eruption appearing and disappearing frequently, "according to the temperature of the air or the exposure of the patient, and the degree and kind of exercise which he uses." The slightest friction or scratching will almost immediately bring out the wheals on any part of the body;

but when thus excited, they usually recede again in a very short time. The eruption consists of irregular patches slightly raised and firm to the touch, or of elongated wheals, "like those produced by the stroke of the whip, or they are round, resembling the firm, elevated tumours produced by the bite of a mosquito." These wheals are not surrounded by an erythematous areola, although sometimes encircled by a very narrow and faint streak of red. They are always attended with violent itching, and a sensation of tingling or stinging pain, more particularly "on undressing and getting into bed." Languor, headach, transient pains, and derangement of the digestive functions, are apt to occur during the course of the disease; but in some instances scarcely any symptoms of constitutional or sympathetic disorder, except the cutaneous affection, attend. "Its course varies from a few days to many months, and even years." (Bateman.)

Urticaria tuberosa.—This rare variety of the disease is characterized by hard, prominent wheals, or tuberosities, attended with deep-seated pain, tension, and difficulty of motion. The eruption occurs chiefly on the loins and on the extremities. It generally comes out at night, and disappears before morning, leaving the patient, "weak, languid, and sore, as if he had been bruised or much fatigued." Cazenave and Schedel state that they saw at the hospital St. Louis, an instance accompanying a quotidian fever, which, after having lasted for four years, finally terminated "in swellings, great distention, ecchymosis, ruptures, and ulcerations." Some paroxysms were attended with so much general tumefaction, as to produce oppressed and hurried respiration, a livid and puffed face, weak and intermitting pulsation of the heart, and other very alarming symptoms.

Urticaria subcutanea.—In this variety the wheals seem, as it were, to lurk beneath the skin, and make their appearance only at distant intervals. An almost constant tingling sensation, however, is felt in the skin, with occasional severe pricking sensations, as if needles were thrust into the surface, limited at first to a single part, but extending afterwards to others. Individuals affected with this variety of the disease, are apt to suffer frequent pain in the stomach, and cramps in the muscles of the legs. (Bateman.)

Causes.—Urticaria is most commonly met with in children, young females, and in persons of a sanguine and nervous temperament. The seasons most favourable to its occurrence are spring and summer. Some individuals are so strongly predisposed to the disease, that the least friction or scratching almost immediately brings out large wheals. The irritation of dentition, mental excitement, and various articles of food, such as strawberries, raspberries, mushrooms, honey, oatmeal, green cucumbers, almonds, dried or smoked fish, lobsters, shrimps,

crabs, and particularly *muscles*, are apt to produce febrile urticaria in some individuals. The internal use of valerian and *balsam copaiba* produce extensive urticaria in some persons. Chronic urticaria is frequently connected with an irritable and deranged state of the digestive functions. The *tuberous variety* "seems to be excited by excess in diet, overheating by exercise, and the too free use of spirits." Urticaria is also produced by direct irritating applications to the skin, particularly by the leaves of the common nettle (*urtica dioica*) and by the contact of certain caterpillars, as the *phalæna processionacea*. It occurs sometimes in the course of various febrile diseases, and is often speedily produced by taking a draught of cold water after the body has been excited or heated by exercise. In many instances, however, the disease makes its appearance without any *manifest* exciting cause; and its occasional dependance on peculiar idiosyncrasy or constitutional habit is unquestionable. In children it often occurs during the process of dentition, or apparently from acidity in the primæ viæ, and is in them usually called *hives*.

Prognosis.—Although often an extremely tormenting affection, from the intolerable itching and stinging pain which attend, urticaria is almost universally wholly devoid of dangerous consequences. Werlhof, indeed, observes, that it has in a few instances terminated fatally; but death probably occurs only where the eruption is secondary, and associated with some other more serious malady. Richter says that in children the disease is sometimes accompanied with great difficulty of breathing. The sudden recession of the eruption does not appear to give rise to any unfavourable consequences.

Treatment.—In the febrile variety of the disease, advantage may sometimes be obtained from an emetic of ipecacuanha. Richter states that the operation of an emetic will occasionally put a speedy stop to the progress of the disease. In general, however, one or two mild laxatives, rest, simple diet, cooling drinks, and the occasional use of the tepid bath, will be sufficient. Where there are symptoms of acidity in the primæ viæ, magnesia or alkaline remedies, particularly lime-water, will be proper. When the disease occurs in irritable and debilitated subjects, or in persons of weak and disordered digestive powers, benefit may be derived from moderate doses of quinine, sulphuric acid, and the usual preparations of iron, after the alimentary canal has been evacuated by emetic and laxative remedies. Reil says, copious draughts of cold water often produce a very good effect.

In the chronic variety of urticaria, particular attention should be paid to the diet; for, in some instances, it would seem to depend on some article of food rendered oppressive or irritating to the stomach by constitutional habit or idiosyncrasy. "I have,"

says Willan, "desired several persons affected with chronic urticaria, to omit first one, and then another article of food or drink, and have thus been frequently able to trace the cause of the symptoms. This appeared to be different in different persons. In some, it was malt liquor ; in others, spirit or spirit and water ; in some, white wine ; in others, vinegar ; in some, fruit ; in others, sugar ; in some, fish ; in others, unprepared vegetables." Almost all the useful diaphoretic alterative remedies, such as sarsaparilla, the root of burdock, the golden sulphuret of antimony, dulcamara, Lisbon diet drink, &c. have been at times recommended, but they rarely appear to afford any particular advantage. Fowler's solution, however, is a very efficacious remedy in the chronic form of the disease. It is mentioned by Cazenave as having been successfully used in a very obstinate and distressing case of this kind. Dr. Dewees has used it frequently with success, and I have myself employed it in a few obstinate cases with the happiest effect.

To relieve the extreme itching, various external applications have been recommended. Vinegar and water, or lemon juice diluted with water, will sometimes procure considerable relief. The tepid bath also, may be used as a palliative for this purpose. Sea-bathing, or washing with salt water, has been used with good effect, both as a palliative and a curative means. Dusting the affected part with rye-meal or hair powder, gives some relief from the itching and tingling.

Sect. IV.—*Miliaria.—Miliary Fever.*

This is a febrile affection, characterized by an eruption of acuminated vesicles, of the shape and size of millet seed, more or less thickly scattered over the surface of the body. These minute vesicles are at first red, and surrounded with erythematous areolæ, which run into each other when the eruption is copious, and give a uniform vivid redness to the surface, (*miliaria rubra.*) In the course of from twenty-four to forty-eight hours, they enlarge, and the contained fluid becomes whey-like, giving them a white or pearly appearance, (*miliaria alba.*) When the vesicles are very numerous, some of them unite, and form here and there vesicles of the size of a pea ; and on some parts they are closely grouped into irregular patches of various sizes. In a few instances, some of these confluent vesicles become filled with a purulent fluid, (*miliaria purulenta.*) In some cases the eruption retains its red colour throughout ; and occasionally the vesicles are white from the commencement.

The miliary eruption appears in general as a symptomatic exanthema in various forms of fever ; "in continued, remittent,

inflammatory, and contagious, as well as other diseases ;" and it has been much doubted whether it ever occurs as an idiopathic or independent malady. Bateman says, that "it is perhaps invariably symptomatic ;" and this would seem to be the general sentiment at the present day. Cazenave, nevertheless, asserts, "that there are instances where it is idiopathic, as when it occurs in persons in good health, after violent exercise during the heat of the summer ;" and Richter expresses the same opinion.

The appearance of the eruption is almost always preceded by premonitory symptoms; such as a sense of anxiety in the epigastrium; weight and oppression in the breast, accompanied with a short dry cough; pains in the loins and extremities; a benumbed prickling sensation in the fingers; stinging, itching, and burning pain in the skin; a small, frequent, contracted, and tense pulse; cephalalgia; vertigo; ringing in the ears; and a feeling of heaviness in the head; creeping chills; disposition to syncope; palpitation; twitching of the tendons; delirium. The most characteristic phenomenon, however, is the profuse sour rank sweat, which is said almost invariably to occur just before and during the appearance of eruption. Sometimes, however, the miliary vesicles come out without any precursory symptoms whatever.* The eruption always appears first on the neck, breast, and on the inner surface of the arms; and then successively on the abdomen, back, and inferior extremities. The duration of the eruption is very variable. In some instances it disappears as early as the fifth or sixth day; but in the majority of cases desquamation does not take place until the ninth or tenth day, and occasionally not until a still later period. Not unfrequently the eruption of vesicles is repeated twice, thrice, and even a fourth time, so as to protract the whole course of the disease to the sixth or seventh week. In most instances new vesicles appear daily for five or six days, and longer. This eruption appears to be peculiarly liable to recede from the slightest causes; and the consequences of a sudden retrocession are often extremely alarming. Great anxiety in the præcordial region; extreme restlessness; increased febrile irritation; violent delirium; coma; or strong pulmonary congestion with distressing dyspnœa, are among the consequences which are apt to result from this accident. If under these symptoms the eruption do not re-appear, or copious diarrhœa, or some other evacuation, do not ensue, a fatal termination will be almost inevitable. (Richter.)

This eruption does not appear to be the effect of critical effort in the system, or in any degree to diminish the general symptoms, if we except those miliary vesicles which sometimes occur towards the termination of rheumatic fever and gout.†

* Richter, Specielle Therapie, Bd. ii. p. 541.

† Stoerk, Barretta, Dissert. de Miliaris Natura, &c. as quoted by Richter.

Causes.—That the miliary eruption is, generally, an artificial disease, has been long ago fully established. In the latter part of the seventeenth, and the commencement of the eighteenth century, when the alexipharmic or heating and sweating plan of treatment was so much in vogue on the Continent, miliary fevers of the most fatal character were among the most frequent diseases. As soon as the antiphlogistic and cooling method of treating febrile affections became more universally adopted, the miliary disease was but rarely observed; and it is now almost an unknown affection, except in its mildest form. By a stimulating, sweating, and heating treatment, miliary vesicles may be produced in every variety of febrile disease; and as such a plan of treatment is peculiarly apt to render even mild and manageable fevers dangerous and malignant, we may readily conceive how fatal the diseases must have been which were thus fomented into the miliary eruption. Sometimes, however, miliary vesicles make their appearance in acute diseases under the best regulated antiphlogistic treatment; and there can, I think, exist but little doubt, that an eruption of this kind appears at times as an idiopathic disease. I have seen but few instances of this kind; but one case which came under my notice within the present year, was apparently of this nature. The patient, a child, complained a few days of slight indisposition, which was followed by an eruption of innumerable red points or vesicles. On the second day they became more distinctly vesicular and whitish, and continued until the fourth day before desquamation began. There was throughout the disease a constant moderate perspiration.

Cazenave and Schedel observe, that "in certain cases of violent entero-colitis, accompanied with general debility, the miliary eruptions, which often occur at night during the paroxysms, present the next day a complete vesicular appearance, and the portion of skin which they cover, is destitute of redness, and appears as if a multitude of minute drops of limpid water had been sprinkled over its surface."

The affections in which the miliary eruption is most apt to occur, are: puerperal fever; gastro-intestinal irritation or inflammation; inflammation of the serous membranes; rheumatism; and Richter says that females affected with severe leucorrhœa are particularly liable to this affection on the occurrence of febrile irritation. The occurrence of this eruption is said to be favoured by a confined and damp atmosphere; excessive sanguineous and mucous discharges; insufficient and innutritious diet; acid and other irritating substances in the alimentary canal; and intemperance.

Treatment.—The attending fever must be treated according to its character and symptoms, without any regard to the miliary exantheme. In general the febrile irritation is sthenic, and

requires an antiphlogistic treatment, and cooling regimen. In short, where the eruption is symptomatic, we must prescribe for the original malady, and not for the cutaneous affection. The idiopathic cases are mild, and require little more than gentle aperients, cooling drinks, and free ventilation, without, however, exposing the patient to a cold or humid air.

The diet, of course, must be mild and unirritating; and in instances which manifest much gastric derangement, a gentle ipecacuanha emetic may be given with advantage. When the eruption recedes, and unfavourable symptoms ensue, we should endeavour to recall it to the surface by warm bathing and mild diaphoretics—such as Dover's powder; and where the arterial action is low, by the internal use of carbonate of ammonia, infusion of serpentaria, camphor, and opiates.

Sect. V.—*Lichen.*

This affection is characterized by minute firm elevations or pimples, (papulæ,) generally appearing in clusters, usually of a white colour, sometimes red, and attended with considerable itching. Systematic writers describe many varieties of the disease.

Lichen simplex.—The disease almost invariably commences with transient flushes of heat in the face; lassitude; a slightly accelerated pulse, and occasionally severe headach; weakness; painful sensations in the stomach, and general febrile irritation. The eruption consists of red and inflamed miliary pimples, attended with heat and itching. In three or four days the redness begins to fade, and on the following day desquamation commences, which is usually completed in three or four days more, unless successive crops of papulæ appear, which sometimes occurs. In the chronic variety of simple lichen, the pimples are usually white, and but slightly or not at all inflamed. The eruption is preceded by moderate itching. The papulæ are seldom very perceptible, but in passing the hand over the skin it receives the sensation of a slight roughness from the small firm elevations on the surface. Its course is tedious, and of uncertain duration, lasting often several months. The skin becomes thickened, and at last exfoliates in large scales. *Acute* lichen occurs most commonly on the face and body; the *chronic,* on the extremities, more especially on the back of the hands.

In irritable habits it sometimes returns every summer. Persons subject to gastric pains and headach, are sometimes affected with this eruption, as if by crisis, when these affections go off. (Bateman.) Sometimes the pimples occupy the roots of the hairs of the skin. (*L. pilaris.*) And in this case the disease generally

continues long. In some instances the papulæ appear in patches or groups, well defined, and approaching to the circular form. (*L. circumscriptus.*) These spread, at the same time that the central part heals and exfoliates, remaining, however, slightly red and scurfy. Occasionally the patches are livid, the pimples being soft and flat. (*L. lividus.*) These are sometimes mixed with dark red or purple maculæ from sanguineous extravasation, occurring most commonly on the lower extremities of relaxed debilitated subjects. The eruption is sometimes disposed into the form of a long stripe or band, extending in a spiral manner round an extremity. (*L. gyratus*, Biett, Cazenave.) At times the eruption consists of larger pimples than the usual size. (*L. urticatus.*) They are inflamed, prominent, large, confluent, "and resemble the stings of a nettle." They come out suddenly on the face or neck, particularly in young persons and females in the summer. A burning pain and considerable itching attends. They usually disappear in a short time, but often return at irregular intervals. (Cazenave and Schedel.) Infants at the breast are subject to a modification of this eruption, (*L. strophulus*,) in which the papulæ are "either redder or whiter than the skin, and attended with great itching, which is much increased by the heat of the bed." It is acute in its character, and subject to distinct exacerbations. (Cazenave.)

Lichen agrius.—This is conspicuously febrile; the eruption consists of a multitude of vividly red miliary pimples, aggregated into large patches, seated on a diffused erythematous surface. Itching, heat, and a sense of painful tingling, greatly increased by the heat of the bed, by active exercise, and stimulating ingesta, are experienced. Morning remissions and evening exacerbations occur. The skin around the patches is generally painful and somewhat swollen. The eruption and general symptoms usually increase until about the fourth or fifth day, when small ulcerations appear on the summit of the pimples, discharging a sero-purulent fluid, which concretes into small, yellow, prominent crusts. These finally fall off, and are succeeded by thin scales. The disease usually continues from twelve to fifteen days. The itching and stinging sensation in this variety of the disease is often extremely violent. In many instances the eruption appears and disappears several times before it finally goes off. The skin of the affected parts generally, at last, becomes harsh, chappy, and extremely painful when rubbed. This variety may terminate in *impetigo*, a chronic pustular affection. (Bateman). When the eruption recedes, from exposure to cold, it is apt to be followed by an increase of fever, headach, vomiting, and colic pains. *Simple lichen* may assume this form of the disease. L. agrius is most apt to occur in young persons of vigorous and sanguineous habits. (Cazenave.) Lichen may also

acquire a chronic character. In this case the cuticle becomes harsh, hard, full of fissures, dry, and rough, particularly in the hollow of the articulations.

Causes.—Lichen occurs in persons of all ages, and in both sexes. Summer and spring are the seasons most favourable to its occurrence. High temperature, particularly the heat of the sun, is apt to excite it. Mental affections, stimulating potations habitually indulged in, gastro-intestinal irritation, and internal inflammations, are mentioned among its most obvious causes.

Diagnosis.—Simple lichen may be distinguished from *eczema* by its acuminated, solid, and very prurient pimples; the eruption of eczema consisting of transparent vesicles, attended only with slight smarting pain. From *scabies*, lichen may be known by the distinct vesicular character of the former, and its usual location on the bends of the joints and between the fingers. The vesicles of lichen are aggregated in clusters. From *prurigo*, lichen is distinguished by the flat, irregular appearance of the papulæ in the former, and their being usually lacerated, and covered with small blackish crusts. The itching and burning of prurigo is always extremely distressing; in simple lichen it is generally slight. (Cazenave.) *Lichen circumscriptus* sometimes resembles *herpes circinatus;* but may be known from it by the red, or more strongly inflamed state of the skin surrounding the margin of the latter; and the distinct papular character of the former, both in the centre and at the border of the patches; whilst in herpes the central disk is free from vesicles. Lichen urticatus may be mistaken for *erythema papulatum*, or *syphilitic lichen.* The diagnosis between them consists in the large size of the erythematous patches, their pale-red colour, the almost entire absence of itching, their less prominence, and their not appearing and disappearing several times in succession. The copper colour of the papulæ of syphilitic lichen, their freedom from inflammation and much itching, and their slow progress and long continuance, distinguish it from L. urticatus. From *chronic eczema* lichen agrius is often not easily distinguished. The presence of lichen, however, may be known by the great itching, roughness and thickening of the skin, and the appearance here and there of distinct pimples.

Prognosis.—Lichen is never a dangerous, but sometimes an extremely troublesome and disagreeable affection. The precursory fever is seldom so great as to keep the patient confined, and in the majority of instances it is wholly absent. By violent friction and scratching, and sometimes spontaneously, severe excoriations and burning pain occasionally occur, which are almost always difficult to remove. When the eruption is repelled by improper applications, or by other injurious influences,

as cold, severe fever, internal inflammations, great heat, thirst, fixed pains in the abdomen, vomiting, &c. sometimes ensue.

Treatment.—In the simple variety, tepid bathing; mild aperients; diluent acidulated drinks; abstinence from heating drinks, food and exercise; are all that is necessary to prescribe. Dry, irritating applications are improper—particularly sulphur, and the metallic oxydes. To relieve the severe itching and burning in the affected parts, we may apply cream, or wash the part with flaxseed tea, or some other mucilaginous fluid. When the affected parts become very red and irritated, attended with constant stinging pain and itching, a laxative dose of calomel may be given occasionally, and fresh, unsalted butter applied. In the chronic forms of the disease, alkaline and sulphurous baths, mild laxatives,* tepid bathing, at first with the water of scalded bran, "and afterwards with water rendered alkaline by adding subcarbonate of potash, in the proportion of half an ounce or an ounce to four or five pounds of water." Cazenave advises, in severe cases of this kind, anointing the eruption with one of the following ointments.† During desquamation, the internal use of the diluted sulphuric acid is often beneficial.

The treatment must be more active, however, in *lichen agrius.* Here sanguineous evacuations, both topical and general, are often necessary in the beginning of the complaint; but when blood is drawn by topical means, it must be taken from a sound part of the skin. (Cazenave.) Low diet, laxatives, diluted nitric or sulphuric acid taken internally, laxative doses of calomel, alkaline sulphurous baths in the decline of the malady, the internal use of Fowler's solution, with a gradual increase of the dose, until it produces gastric disturbance, are the means generally relied on in cases of this kind.

Sect. VI.—*Eczema.*

Eczema is a vesicular eruption, which occurs both in an acute and chronic form. Cazenave and Schedel divide acute eczema

* ℞. Calomel gr. xii.
Hydrarg. sulphur. nigr. gr. xxxvi.
M. Divide into 12 equal parts. S. Give one every other evening to a child of from 2 to 7 years old, with a small dose of ol. ricine on the following morning.

† ℞. Calomel ʒss.
P. camph. gr. xii.
Axungiæ ʒi.
M. f.
Or—
℞. Protoioduret hydrarg. gr. xii. to ℈i
Axungiæ ʒi.
M. f.

into three varieties, namely, *E. simplex*, *E. rubrum*, and *E. impetiginodes.*

1. *E. simplex.*—The eruption consists of innumerable small, closely approximated, transparent vesicles, without any surrounding inflammation, distributed over a greater or less extent of the surface—the skin every where retaining its natural colour. No premonitory symptoms, but only a slight itching, precede the eruption. The fluid in the vesicles soon becomes opaque, and after a short period is absorbed ; the vesicles then shrivel, and the cuticle desquamates slowly. It never spontaneously gives rise to inflamed surfaces. This eruption is usually local, or confined to certain parts—commonly the arms and between the fingers, and being attended with severe pruritus, may be mistaken for the itch. Heating and irritating applications to the skin often produce this affection. "It often appears between the fingers of women in child-bed ;" and in persons who are much exposed to the heat of a fire. It is sometimes associated with itch, and appears to be excited by the irritating remedies usually employed for the cure of that affection.

2. *Eczema rubrum.*—Heat, stiffness, and some tingling in the skin, precede the eruption in this variety. The affected surface is inflamed and vividly red, covered with very minute acuminated pimples, of a shining white or pearly hue. After some time, vesicles of the size of a pin's head, surrounded with distinct red areolæ, appear on the affected parts. In the course of six or seven days, the contained fluid is absorbed, the vesicles shrivel and desquamate, leaving a pale red surface, sprinkled with minute rounded papulæ, each rising from a small whitish disk. In some instances the cutaneous inflammation increases, and continues beyond its ordinary duration ; the vesicles become confluent, break, and discharge an irritating fluid, which causes superficial excoriations ; and at last, concrete into large, thin, pliant scales, leaving inflamed surfaces on falling off.

3. *Eczema impetiginodes.*—Violent inflammation, swelling of the affected parts, and vesicles generally congregated or confluent, filled with a *sero-purulent fluid*, are the principal characteristics of this variety of the disease. These purulent vesicles soon break, and the fluid concretes into soft, yellowish, and often extensive scales, or thin crusts. When these fall off, they leave red surfaces, exuding a reddish fluid, which dries into thin laminæ. The eruption is commonly confined to a particular part, or even a single spot. Occasionally, however, it occurs over the whole body, and is attended with considerable fever. The disease may continue from ten to twenty days, and upwards. The vesicles are generally transparent at first, and become pustular afterwards. This variety also sometimes assumes a chro-

nic character, resembling then the chronic state of eczema rubrum.

4. *Chronic eczema.*—When acute eczema is very severe, it often terminates in chronic excoriations and fissures of the skin on different parts of the body, particularly in the bends of the knees and elbows, and about the axillæ. The parts thus irritated and inflamed, exude an abundance of serous fluid, which causes the linen to adhere to them. In this state it usually remains for several months, the discharge continuing undiminished. In some instances, the exuded serum dries into soft, yellowish, and thin crusts, leaving an inflamed and nearly dry surface when they fall off. "These crusts form at greater intervals; they become drier, and the disease seems on the point of disappearing, when on a sudden, and without any assignable cause, the inflammation acquires greater intensity." New vesicles arise, which, like the former, soon break and discharge their fluid; "and the affection goes through the same course, and the disease may thus last for years." (Cazenave.) Sometimes, the thickened, red, fissured skin, remains dry, and the crusts are drier, more firmly attached, and of a brownish yellow hue, leaving but a slightly red surface when they separate. Occasionally indeed, the skin for a long time remains vividly red, cracked, with dry scales of altered cuticle thinly scattered over the surface. Chronic eczema commences on a limited portion of the skin, often not above a few inches in diameter, and spreads afterwards over a greater or less extent of the surface. The itching is always very great, and returns by spells, causing an irresistible desire to scratch.

The parts furnished with hair, the region of the pubis, the arm-pits, groin, scrotum, pudendum, and the bends of the joints, are most apt to become the seat of eczema, although every part of the body may become affected with it.

Causes.—Though not contagious, yet instances do occasionally occur, in which this disease is communicated from one to another by protracted contact. (Biett, Cazenave.) It occurs more frequently in women than in men, and in the warm than the cold seasons. Its general cause is unknown. It may be excited by direct irritating applications to the skin, as a blister, sinapisms, turpentine, valerian root, the rays of the sun,* dry frictions, and irritating ointments, lime, and sugar.† The use of mercury, when long continued, sometimes produces a very severe variety of eczema.

* The *prickly-heat* or *heat-spots* are classed with this variety of eruptions. (Willan.)

† Persons who are in the habit of handling or working in sugar are liable to an eruption of this kind on the hands, called the *grocer's itch.* (Bateman.) And bricklayers are subject to a similar affection from the irritation of lime.

Diagnosis.—Simple eczema often greatly resembles itch. They may be distinguished by the following circumstances. In eczema, the vesicles are flat or rounded; in itch, pointed; in the former, they are nearly or entirely in contact with each other; in the latter, they are single and considerably separated. The itching of eczema is attended with smarting pain; in itch, the pruritus "is rather agreeable than painful."

The *impetiginode* variety of eczema has been confounded with impetigo. The former, however, occupies large spaces, the latter usually small ones. The eruption in impetigo is strictly pustular from the beginning. In eczema impetiginodes, it is vesicular at first, the vesicles being generally transparent, and never contain genuine pus, as they do in impetigo. In the latter, desiccation gives rise to thick, yellowish, uneven *scabs*; in eczema, only thin pliant scales are formed. Vesicles of eczema rubrum surround the latter, but they never appear in impetigo.

Chronic eczema is very liable to be confounded with *lichen* and *psoriasis*. Lichen agrius, the variety most apt to be mistaken for chronic eczema, differs from this affection, in the thick, small, and yellow appearance of the scales or scabs, and the papular appearance of the surface which they leave on falling off; whereas, the surfaces left by the separation of the thin lamina in eczema, are smooth, red, often shining, and generally slightly excoriated. In lichen, small hard papillæ may be seen around the eruption; in eczema, vesicles only appear in the neighbourhood of the eruption.

Treatment.—Diluents, acidulated with sulphuric, or nitric acid; a light and simple diet; occasional tepid bathing; gentle laxatives; and where the eruption is extensive, alkaline and sulphurous baths;* with some of the milder vegetable tonics, such as infusions of cinchona, serpentaria, or colomba when languor or debility exists, are the principal useful measures in this variety of the complaint. When the eruption continues long, advantage may be obtained from rubbing the affected parts with sulphur ointment.

In *eczema rubrum* and impetiginodes, frequent bathing, or emollient fomentations of the affected parts, will generally moderate very considerably the itching pain and tenderness of the eruption.† Emollient poultices also often answer well as a palliative application. After exfoliation, the following ointment may be beneficially applied to the tender and half-excoriated

* The alkaline bath is made by dissolving five or six ounces, or more, of the subcarbonate of potash or soda in a bath. The sulphurous bath is made by adding about four ounces of sulphuret of potash to a bath. (Cazenave.)

† The French are in the habit of using a decoction of bran, or the water of scalded bran, for this purpose. Cazenave and Schedel recommend cataplasms made of potatoes and some emollient decoction.

surface* by means of linen rollers renewed twice daily. Mild laxatives should be regularly given; and a simple, unirritating diet, as well as total abstinence from all kinds of stimulating drinks, enjoined. It will also be useful to administer refrigerant diaphoretics, such as sweet spirits of nitre, small portions of nitrate of potash with tart. emetic, spiritus mindereri, and to allay nervous irritation and procure rest at night, full doses of Dover's powder with a few grains of calomel in the evening. The diluted mineral acids with tonic bitter infusions will at times be proper during the subsidence of the disease. All kinds of irritating applications must be avoided. When the exciting cause is obvious, and of such a nature as to enable us to remove it, the first step in the treatment must of course be to obviate its influence.

In *chronic* eczema, emollient baths of about the temperature of 90° Fahr.; the internal use of nitric or sulphuric acid; occasional laxatives; alkaline solutions internally, and when the itching is great, externally,† are among the principal remedies in this form of the disease. One or two of Plummer's pills‡ given twice daily, have been found very useful in chronic eczema. Benefit may also be derived from laxative doses of calomel and pulvis antimonialis, with an occasional dose of sulphate of magnesia or soda. Sulphurous waters, employed both externally and internally, will, in general, contribute materially towards the removal of the disease. Infusions of sarsaparilla, chimaphila, or of the slippery-elm bark, with small portions of antimony, may also be usefully employed. In a very severe and inveterate case of chronic eczema, I prescribed the following pills, in conjunction with sarsaparilla syrup, with complete success.§ In the dry, scaly, cracked form of local eczema, "as

* ℞. Emplast. plumbi ʒii.
Ceræ flavæ ʒss.
Olei amydal. dulc. ʒiss.
Melt the plaster with the wax, then add the oil, and stir the mixture until it has entirely cooled. This ointment is particularly recommended by Dr. Pearson. —See *Bateman's Synopsis*, &c. p. 12.

† "Half a drachm of the subcarbonate of potash dissolved in a pint of infusion of chicory may be given internally." Washing the affected parts with a solution of the subcarbonate of potash or soda, before going to bed, will generally afford much relief. (Cazenave.)

‡ ℞. Calomel.
Antimon. sulph. præcipitat. āā ʒii.
Pulv. g. guaiac. ʒiv.
Sapo. venet. ʒii.
Mf. pl. āā gr. iii.

§ ℞. Muriat. hydrar. corosiv. gr. iii.
G. opii. gr. x.
G. camphor. gr. xx.
Conserv. rosar. q. s.
M. Divide into 40 pills. Take one every morning, noon, and evening.

it occurs in the hands," Cazenave recommends frictions on the part, with an ointment made by mixing half a drachm of proto-nitrate of mercury with an ounce of lard; or of twenty grains of proto-ioduret of mercury rubbed up with an ounce of axunge. I have known a case of this kind cured by the following application,* first recommended, I believe, by Alyon. (*Essai sur les Proprietés Med. de l'Oxygene.*)

Washing the affected parts with an infusion of stramonium leaves, or of solanum nigrum, or hyoscyamus, will generally greatly allay the itching and painful irritation. When the eruption is confined to a limited surface, solutions of borax, lime-water and milk, or an ointment made by mixing half a drachm of calomel with an ounce of lard, may be occasionally applied with benefit. The best local application, according to my own experience, however, is stramonium ointment intimately mixed with a portion of calomel, in the proportion of thirty grains of the latter to an ounce of the former. The tincture of cantharides is sometimes very efficacious in obstinate cases of this affection. Cazenave states that it is particularly useful in the eczema of women.† Arsenic also has been used with complete success in inveterate instances of chronic eczema. (Biett, Cazenave.) The Asiatic pills appear to be the best arsenical preparation in this affection. One of these should be taken daily, and continued for several months. I have employed Fowler's solution in several cases with marked advantage.

Sect. VII.—*Erythema.*

The term erythema, is applied by Willan, and other late writers, to a cutaneous affection, characterized by a slight superficial irregularly circumscribed redness of some portion of the skin, attended with symptoms of constitutional disorder. It is most commonly seated on the face, breast, and extremities, and continues usually from one to two weeks. It appears generally as a symptomatic affection—although in many instances it occurs without being preceded by any obvious constitutional symptoms. Superficial spots of a vividly red colour, variable in size, and attended usually with very slight heat and pain, come out on a

* ℞. Axunge ℥viii. Melt it, then gradually add, *nitric acid* ℥i. and stir until it is cold.

† Cantharides have been successfully employed in various chronic cutaneous affections. Keir relates several very obstinate instances of *impetiginode* affections which yielded to a protracted course of this remedy, (*Voigtel's Arzneimittell, bd.* ii. *Abth.* ii. s. 15.) Home also gave it successfully in herpatic affections, (*Clinical Experiments*, &c.) Tilenius, (*über die Flechtenart. Hautauschl.* 1802,) and Simons, (*Med. Comment.* vol. i.) relate instances of its successful employment in similar diseases.

greater or less extent of the surface. When these spots are pressed with the finger, the redness disappears for a moment, as in erysipelas. In some instances, not the slightest tumefaction attends; but in others, the spots become swollen and firm to the touch. Sometimes the bright red patches are irregularly roundded, and present on their first appearance a slightly elevated rough or papulated surface. In a few days the redness becomes more vivid, and afterwards changes to a violet hue, particularly on the central parts of the patches. The slight swelling subsides in the course of the second day, but the redness continues from about ten to fourteen days. This variety of the disease (*the E. papulatum of Willan*) is most frequently met with in females and young persons, and is usually seated on the neck, breast, and arms. It is sometimes attended with much general disorder—such as anorexia; a small and frequent pulse; great depression of strength and spirits; and acute pain in the limbs. In most instances, however, the constitutional symptoms are slight. (Bateman.) In some cases "small slightly elevated tumours are interspersed through the patches," which continue six or seven days before they disappear—the redness going on for about a week longer. (*E. tuberculatum.*) This eruption frequently appears also in the form of red oval spots, usually seated on the anterior part of the legs, and sometimes, though rarely, on other parts—as the chin and arms. The spots become elevated towards the centre, and are firm and painful to the touch, presenting the appearance of slight nodes when seated on the tibia. These protuberances rise slowly, and subside about the eighth or ninth day, at the same time that their colour becomes bluish, as from a bruise. This variety of the disease is preceded for four or five days by moderate fever, general uneasiness, and depression of strength. Bateman says that it seems to occur only in females; but Cazenave and Schedel state that it is met with also "in infants, and in young persons of a weak constitution and lymphatic temperament." This variety constitutes the *E. nodosum* of Willan. The erythematous spots which sometimes occur in acute diseases as symptomatic eruptions, (*E. fugax*) are usually of short duration, and resemble the redness produced by pressure or friction. They occur also in chronic affections, "especially those in which the primæ viæ are deranged."

Causes.—Erythema may be produced by the direct action of irritating agents on the skin, such as the direct rays of the sun; acrid secretions or discharges remaining long in contact with the skin; and by the chafing of two contiguous surfaces, as between the breasts, in the arm-pits, groin, and on the buttocks and internal parts of the thighs from riding on horseback. It occurs symptomatically from intestinal irritation, dentition, menstrual irregularities, particularly about the decline of the

menses, from irritation in the stomach, and in almost every form of acute disease. It is sometimes associated in œdema, or anasarca of the legs.

Diagnosis.—From erysipelas, erythema is distinguished by the limited extent of the spots; the absence of pain, of vesication, and of tumefaction; and the mild nature of the disease. From *roseola* it differs in its vivid redness, and in the less distinctly defined circumference of its spots or patches. The spots of roseola are never raised above the surrounding skin; those of erythema nodosum are. Erythema papulatum may be known from *urticaria* by the greater elevation of the latter, and the great itching which always attends, as well as by its "irregular and often rapid course." The absence of itching in erythema distinguishes it also from *lichen urticatus.* (Cazenave.)

Treatment.—Light diet, gentle diaphoretics, the internal use of the mineral acids, laxatives, warm baths, tepid ablutions, and soothing applications when it occurs from the friction of surfaces, such as aqueous solutions of borax, opium, acetate of lead, or pulverized starch, or the powder of lycopadium, comprise all that is necesssary in idiopathic erythema.*

Sect. VIII.—*Roseola.*

This affection consists of rose-coloured spots, of various forms, without swelling or elevation of the skin or papulæ, and is usually preceded and accompanied by febrile symptoms. These efflorescences may occur over the whole surface of the body, but they are usually confined to one or more parts. Its course varies in duration from one to about six or seven days. Sometimes the rose-red spots are nearly circular, contiguous to each other, and not above three or four lines in diameter. They are usually connected with disorder of the stomach and bowels, and occur almost exclusively in infants, and they seldom last longer than thirty-six hours. During dentition these spots are apt to assume an irregular and nearly confluent appearance, and generally succeed violent symptoms of gastro-intestinal disorder, such as vomiting, diarrhœa, and fever.

There is a variety of this eruption which has been mistaken for measles, and which is most apt to occur in children during summer. (*R. æstiva.*) It commences with chills, languor, headach, followed by febrile reaction, and occasionally delirium, and

* To relieve the inflammation and tenderness produced by chafing, the following ointment, applied by strips of soft linen, is often promptly effectual:

℞. Ungt. stramonii ℥i.
Pulv. lithargyri ℥i.
Pub. opii ℥ss. M.

even convulsions. The skin is hot and dry, the bowels are constipated or affected with diarrhœa, and the appetite wholly depressed. From the third to the seventh day after the commencement of these symptoms, the eruption makes its appearance, first on the face and neck, and then gradually spreads over a greater or less extent of the surface of the body. The spots are usually from one to three lines in diameter, resembling the spots produced by touching bibulous paper with the point of a pen dipped in red ink. When the eruption is very copious, the spots run into each other on some parts of the body, but the roseolous points may still be distinguished on the red surface. These spots are not in the slightest degree elevated, yet when the patient has been kept too warm, or when heating diaphoretics are used, a papular eruption is apt to appear along with the roseolous spots. The eruption is attended with troublesome itching, and the febrile irritation continues until it disappears with the eruption. It is often attended with sore throat, or painful deglutition, but not with coryza, inflamed eyes, and cough, like measles. The spots may continue from three to ten days: they disappear without desquamation. Occasionally a second eruption occurs after the first has gone off.

In some rare cases, the rosy spots assume an annular shape, the central parts retaining the natural colour of the skin. (*R. annulata.* Willan.)

Roseola occurs most frequently in women and children, and is not contagious. It occasionally prevails epidemically, and sometimes precedes the eruption of small-pox, or it follows the vaccine affection. Dentition, and a draught of cold water when the body is heated by exercise, may give rise to this eruption; and it is often associated with gastric disorder, particularly in children.

Diagnosis.—Measles and scarlet fever, are the affections with which roseola is most liable to be confounded. The more distinct catarrhal character of measles, the irregular semilunar grouping of its *small* red points, and the vivid redness of its eruption; contrasted with the larger, more circular, well defined, and *rose* red spots of roseola, will generally enable us, without difficulty, to form a correct diagnosis. The small vesicular elevations, the irregularly diffused *raspberry* efflorescence, and the tumefaction of *scarlatina,* are usually sufficient to distinguish this affection from *roseola.* Roseola is not contagious; measles and scarlatina are.

Prognosis.—This disease is almost always wholly free from danger. Heim,* Selle,† and Formey,‡ however, mention the

* Bemerk, über die Verschieden. des Sharlachs, der Roethel und der Masern.
† Neue Beiträge zur natur-und Arzneiwissenschaft, tom. i.
‡ Topographie von Berlin, Richter, Specielle Therapie, Bd. ii. p. 524.

occurrence of very violent and fatal epidemics of this kind. But in these the eruption was probably purely symptomatic of typhous fever. Hildebrandt refers to an exantheme, somewhat similar to this one, as a very constant, though transient, symptom, in the stage of excitement of contagious typhus.

Treatment.—Rest, mild aperients, acidulated cooling diluents, a simple and unirritating diet, an equable and moderate temperature; and where the temperature of the skin is elevated, refrigerant diaphoretics, are, in general, all that is required in the treatment of this affection. When internal inflammations occur, a more vigorous and appropriate course will be demanded.

Sect. IX.—*Purpura.*

Hemorrhœa Petechialis, Ecchymome, Hemacelenose.

This affection is characterized by spots or patches of a vivid red, inclining sometimes to a purple hue, varying in size from a line to several inches in diameter, and retaining their colour under pressure. These maculæ appear often without any perceptible febrile phenomena whatever; but they occur also in the latter stage of malignant fevers, (*petechiæ,*) and in this case are always of the most fatal import. Willan has divided purpura into five species: *purpura simplex; purpura hæmorrhagica; purpura urticans; purpura senilis;* and *purpura contagiosa.*

Simple purpura consists in small bright red patches, appearing usually on the extremities in a successive manner, preceded commonly with slight restlessness, nausea, headach, languor, and want of appetite, but without any obvious irritation of the circulatory system. The duration of this affection is almost always tedious, and varies from a few weeks to many months. The individual spots, however, do not often continue more than seven or eight days—the whole course of the malady being made up either by a continuous succession of the eruption, or a succession of eruptions, with short intervening periods.

This variety of the disease occurs usually in young subjects, and appears equally liable to attack vigorous, sanguineous, and robust, as well as feeble, relaxed, and delicate individuals. It is said to appear more frequently during warm and dry weather, than in the cold seasons. *Its diagnosis* is not difficult. The persistence of the redness when pressed with the finger, is alone sufficient to distinguish it from all other similar affections. Simple purpura is always a mild affection, and though sometimes very prolonged in its course, can never be regarded as dangerous.

P. hæmorrhagica.—The variety of purpura, however, which has attracted the most attention, and which indeed is always a

very serious and alarming affection, is the *purpura hæmorrhagica*,—or *morbus maculosus hæmorrhagicus* of Werlhof. The spots in this variety are generally numerous, and of a dark-red colour, with here and there irregular livid patches, resembling recent bruises. They usually appear first on the legs, then on the arms, and lastly on the body; the hands almost invariably remaining free from them. In some instances the cuticle over these maculæ becomes slightly elevated, with a small portion of bloody serum underneath.* These spots occur also on the mucous surfaces, particularly in the mouth, nostrils, rectum, or vagina, giving rise to hæmorrhages, sometimes so copious as to cause speedy death. In general, however, the hæmorrhage is moderate, returning at intervals, and either ceases spontaneously, or recurs again and again until the system is exhausted, and a fatal termination occurs; sometimes a slight, but *uninterupted*, discharge takes place. The constitutional symptoms vary exceedingly in this affection. Some cases commence with wandering and vague pains, lassitude, restlessness, and exhaustion; others are not preceded by any symptoms of general indisposition. In general, however, the disease, when once developed, is accompanied with a state of depression and languor; yet in relation to the *activity of the pulse*, the greatest diversity occurs in different cases. In some instances it is feeble, soft, and moderately full; in others it is contracted, firm, and very frequent; and in others again, active, full, and resisting. The skin is sometimes above the natural temperature;† though generally it is cool and pale. Cough, pain in the chest, and slight oppression of respiration, frequently precede and accompany the cutaneous and hæmorrhagic affections. Dr. Fairbairn relates a case attended with deep-seated pain in the left breast, increased on coughing and deep inspiration, laborious breathing, and flushed countenance. Dark, venous blood oozed from the gums, cavity of the mouth, and apparently from the mucous membrane of the bronchiæ, and numerous petechiæ or purple spots appeared on the arms, neck, and trunk.‡ Uneasiness in the stomach, with abdominal pain, or tension and weight in the hypochondria, sometimes precede the appearance of the spots. When the disease becomes protracted, more or less anasarcous tumefaction of the legs and face, emaciation, and great weakness and languor, supervene. The duration of this malady is as various as the general phenomena which accompany it. It may terminate either in health or in death, within a few days from its commencement,

* I. G. Arcel, (C. Zetterstrom) Diss. de Hæmorrhœa. Upsal, 1797.

† See Dr. Gardiner's case—Edinburg Med. Chir. Transact. vol. i. p. 671. Also, Dr. Fairbairn's case, quoted below.

‡ Transact. Med. Chir. Society of Edinburg, vol. ii. art. 1.

or run a tedious course of many months. The fatal termination of this affection is frequently the immediate consequence of profuse hæmorrhage from some internal organ. Cazenave states that he has "seen patients suddenly expire from copious hæmoptysis, as well as from hæmatenesis and intestinal hæmorrhage." The spots or maculæ are caused by the extravasation of blood under the cuticle.

Concerning the etiology and pathological character of this remarkable affection, we know, as yet, but little that is satisfactory. Dr. Parry regarded the disease as being decidedly phlogistic, whilst most other writers ascribe to it an opposite character. It is certain, that notwithstanding the extraordinary tendency to hæmorrhage—apparently of the passive kind—the blood drawn with the lancet sometimes coagulates strongly, and exhibits a sizy, and even a cupped and buffy surface.* It is equally ascertained that extensive internal inflammations are sometimes connected with this malady. In the case reported by Dr. Chambers, (Med. and Phys. Jour. Nov. 1826,) "the convolutions of the small intestines were found agglutinated by adhesive inflammation, and the whole arachnoid membrane on the upper part of both hemispheres was covered with lamina of coagulated lymph." More commonly, however, the blood taken by venesection presents none of the appearances indicative of a phlogistic condition. "In many persons who were examined after death in the hospital St. Louis," says Cazenave, "the blood was found in a state of remarkable fluidity." In Dr. Fairbairn's case, the blood coagulated "into a soft and tremulous mass," and in the case reported by Dr. Gardiner, the first blood drawn coagulated imperfectly, and on the following day resembled a tremulous jelly, with a greenish surface interspersed with brownish spots. What was discharged afterwards "was more like turbid lymph, or a fluid in which some reddish colouring matter was suspended."

In the majority of instances, marks of violent venous congestion,† with copious extravasation of bloody serum or dark liquid blood into the internal cavities, are detected on post mortem examination. Petechiæ, too, are often met with on the internal surfaces, particularly on the mucous membrane of the lungs, intestines, stomach, (Fairbairn, *loc. cit.*) and fauces. In some instances almost the whole capillary system takes on the hæmorrhagic action—every structure, whether membranous or parenchymatous, presenting marks of sanguineous extravasation.

* Dr. Stocker, Pathological Observations, &c. part I. p. 36. Parry's Posthumous Works, vol. i. p. 220. See also Dr. Chambers' case.—Med. Chir. Rev. Jan. 1827, p. 201.

† The lungs are sometimes greatly engorged with sanguineous extravasation and congestion. M. Biett saw an instance of violent venous congestion of the tongue. It was of a deep livid colour, and double its natural size. (Cazenave and Schedel.)

Under all this perplexing contrariety of phenomena, our reasonings and conclusions respecting the fundamental pathological character of this affection, must necessarily be vague and unsatisfactory. That it is not essentially an inflammatory disease, though often connected with local inflammation and an active state of the circulation, appears, I think, extremely probable. It is indeed true, that in some of the most violent forms of inflammatory fever, colliquative hæmorrhages and subcutaneous extravasations of blood occur; but these do not supervene until the general powers are prostrated, or a state of collapse is induced by the previous excessive excitement. In *purpura*, however, the petechiæ and sanguineous discharges are sometimes among the first signs of indisposition; and are but very rarely preceded by symptoms of strong vascular or phlogistic action. Dr. Stocker thinks that this affection is attended with an altered and unhealthy state of the blood, "either from want of due preparation of the fluid at the two chief sources of supply, and of the subsequent changes these fluids should undergo in their passage through the pulmonary, sanguiferous, and hepatic systems, or from the injurious effects of diseased functions in the organs of sanguification."* That a dyscracy of the blood exists in this disease, is indeed not at all improbable; but whether this condition of the blood has a direct and principal agency in the production of the characteristic phenomena petechiæ and hæmorrhage; or whether it is only one of the ultimate consequences of the primary and essential disease, is altogether uncertain. To me it seems probable that this affection has a considerable latent period before it manifests itself by external symptoms; that primary disorder of the assimilating functions deranges the healthy constitution of the blood; and finally, that the blood thus deteriorated or changed, being no longer possessed of its healthy relations with the organic sensibility of the capillary vessels, causes these to suffer its ready transmission and extravasation.

Treatment.—The uncertainty which exists in relation to the pathology of this disease, leaves us of course in an equally unsettled state with regard to the principles of its remediate management. The most opposite plans of treatment have been recommended, and practised too, with occasional success. It would seem even that the existing symptoms are often a very fallacious guide; for in some cases marked with all the usual symptoms of general debility, relaxation, and asthenia, the use of tonic and other invigorating means have almost immediately aggravated the disease. Nevertheless, where the disease occurs in old persons or children, enfeebled by previous diseases, privations, or other debilitating influences, a moderate tonic and exciting plan

* Loco cit. p. 40.

of treatment, with an invigorating regimen, has been found most beneficial. Decoctions of cinchona, serpentaria, or rathany; the ferruginous preparations; mineral acids, particularly the sulphuric; wine, and a nourishing diet, may be employed in cases of this kind. The only instance of this disease which has come under my notice, was in a child about seven years old. In this case I employed the nitrate of silver, in quarter grain doses every six hours, together with from fifteen to twenty drops of the spirit of turpentine, with complete success. The case continued for nearly three weeks before it yielded to this treatment.

When the disease appears in adults of good and sanguineous constitutions, and who have not been previously subjected to the influence of enervating causes, tonics and exciting remedies almost invariably do great mischief. In all instances in which there are manifestations of strong visceral congestions, or of inflammation; where there is pain in the chest, in the epigastrium, hypochondria, or the abdomen; where there are evidences of intestinal irritation, or constipation exists; where the pulse is firm, corded, or tense, antiphlogistic measures should be adopted. *Bleeding* is recommended by Parry, and cases have been reported illustrative of its occasional beneficial effects. A case is reported as having occurred in Bartholomew's Hospital, which strikingly illustrates the occasional usefulness of blood-letting in this affection. The whole surface of the body was sprinkled over with purple spots. The gums were spongy, livid, and bloody. "The whole tongue also, was livid, and half of it presented the appearance of a large, black, bleeding fungus, shooting from its surface." Nothing but blood passed by stool. The patient nevertheless felt strong, and had a good appetite. Dr. Latham drew fifteen ounces of blood, which was very buffy, enjoined water gruel, and administered mercurial purges. The patient under this management gradually recovered.*

Where the disease is attended with an active state of the circulation, or with symptoms of visceral congestion or inflammation, bleeding may be practised with a prospect of advantage. It is a measure, however, which requires cautious employment even where it seems to be most clearly indicated; for the natural tendency of the disease to exhaustion and prostration is always great, and may readily be injuriously promoted by incautious abstractions of blood.

Whatever may be thought of blood-letting, almost all writers agree in recommending *purgatives* in this affection. Dr. Harty states, that after he had failed in one case by tonic remedies and a nourishing diet, he resorted to the free administration of purgatives in upwards of a dozen cases, and he avers, with uniform

* Med. Chir. Rev. May, 1828.

success. (Bateman.) He gave active doses of calomel and jalap daily. Of late years the *oil of turpentine*, in purgative doses, has been strongly recommended as a remedy in purpura. Dr. Whitlock Nicholl has reported three cases in which this article was administered with the most satisfactory result.* To a child only two years old he gave half a drachm of the oil with some syrup and water, thrice daily, for ten days in succession. Under this remedy, the disease, though very violent, gradually yielded. Cinchona was, at the same time, freely used. Dr. E. Thompson also gave small doses of turpentine and castor oil with complete success.† Dr. Belcher used turpentine enemata, with manifest advantage.‡ The turpentine with castor oil generally causes large, unnatural, and very fetid alvine discharges; and if the system is, at the same time, supported by tonic infusions, generous wine, and the mineral acids, nothing need be apprehended from the exhausting effects of daily purging with this mixture.

According to the report of Cazenave and Schedel, the treatment usually adopted in the management of this disease by M. Biett, consists in the employment of acidulated drinks and laxatives; and in cases attended with much feebleness and exhaustion, the extract of rathany, (in doses varying from a scruple to a drachm daily,) mixed with ice. This treatment is also recommended by other eminent French practitioners. (Dr. Brachet, of Lyons.)§

Local applications have been recommended to restrain the hæmorrhages, but these rarely afford any other than very temporary advantages. Upon the whole, therefore, moderate bloodletting, where there are strong congestions, or an active pulse; purgatives freely and almost daily employed, together with cinchona, rathany, *tinct. cinnamon*,‖ wine, beverages acidulated with sulphuric acid, and a nourishing diet, constitute the means which experience has found most apt to afford relief in this affection. Advantage might perhaps be obtained from bathing the body in a decoction of oak bark or cinchona, or water strongly impregnated with salt.

* Lond. Med. Repository, July, 1821.—Ibid. No. VI.
† Ibid. No. CXIX.
‡ Med. and Phys. Jour. March, 1825.
§ Cazenave, &c. Synopsis, p. 379.
‖ Jahn. Klinik der Chron. Krank. Bd. p. 308.

CHAPTER XVIII.

VASCULAR IRRITATIONS WITH A FLOW OF BLOOD.

Hæmorrhages.

Spontaneous Hæmorrhage may be defined a disordered state of the vital properties of a greater or less extent of the capillary system, manifesting itself by sanguineous effusion, or extravasation.* It was formerly supposed that hæmorrhages depend invariably on rupture of a blood-vessel; and this opinion is, indeed, still entertained by some pathologists. Dr. Gregory seems to take it for granted that actual rupture of a vessel takes place in all hæmorrhagic effusions.† That this may sometimes occur, cannot be doubted; but this is probably so seldom the case, as to form but a very limited exception to the general fact, that the effusions of this kind depend on a sort of sanguineous exudation, without rupture, or structural lesion of the vessels. In what manner, or through what particular openings, the blood is suffered to escape from its proper vessels, is, however, still a matter of conjecture, or at best of uncertainty. According to Bichat, the blood is discharged through the exhalents; and Reil supposes that it transudes through the coats of the vascular extremities, (*per diapædesin*,) from deficient vital power in these structures, just as we sometimes find the bile percolated through the cystic coats on post mortem examination, or by what Dutrochet calls *exosmose*, through the agency of animal galvanism. When we take into view the results of some late physiological experiments, which go to show that the veins *imbibe* fluids into their cavities apparently through the insensible pores of their coats; it does not appear extravagant to suppose, that, under particular circumstances, they may also give exit to their contents through the same channels. It is nevertheless most probable that the effusion occurs, (*per anastomosin*,) through the exhalents, in the manner so ingeniously explained by Bichat. In consequence of a morbid change in the activity of the sanguineous capillaries, as well as in the specific sensibility of the serous exhalents, the blood passes from the former into the latter, and by these is suffered to escape externally. Whatever doubts and exceptions may have been expressed by some recent phy-

* Bichat, General Anatomy, vol. ii. Reil, Fieberlehre. Bd. iii. p. 23.

† Elements of the Theory and Practice of Medicine, vol. i. p. 517. Second American edition.

siologists, with regard to the agency of what this eminent writer terms *organic sensibility* in the development of diseases, there is much foundation for believing that this pathological principle lies at the root of many of the morbid phenomena of the capillary system. It would be foreign, however, to the scope of this work, to enter into a particular discussion on this head. Those who may desire to obtain a full view of the facts and arguments that may be adduced in support of this pathology of hæmorrhages, may consult the chapters on the capillary and exhalent systems in Bichat's *General Anatomy*.

Pathologists have divided hæmorrhages into *active* and *passive*. A hæmorrhage is said to be *active* when there is a preternatural flow of blood to the part, attended with an increased vascular excitement. In many cases, the whole circulatory system is in a state of increased activity; but the local vascular excitement often approaches, and indeed actually rises to the grade of inflammation, as in the spitting of blood in pneumonia, or the sanguineous discharges in dysentery. The local hæmorrhagic irritation is, however, not always accompanied with an increased momentum of the general circulation. On the contrary, strong local determinations, and an active hæmorrhagic excitement, often exist in an organ, whilst the activity of the heart and arteries is depressed, and the general powers of the system languid. Thus active hæmoptysis and uterine hæmorrhage often occur in persons of weak and irritable habits, with a small, weak, and frequent pulse.

Active hæmorrhages occur most frequently in young, plethoric, and irritable persons, and in those who are constitutionally predisposed to strong irregular determinations of the blood to particular organs, as the head, the lungs, or the abdominal viscera. They occur in inflammatory fevers, either as accidental or *critical* evacuations; and in this case, they are always to be regarded as favourable.

In many instances, the eruption of the blood is preceded by various premonitory symptoms; but in others, the hæmorrhage comes on suddenly without any manifestations of its approach whatever. Among the symptoms which announce the approach of active hæmorrhages, may be mentioned, a full, frequent, rebounding (*dicrotus; bis feriens*) pulse; alternate flushes of heat and chills; redness, tension, and fulness of the skin; increased sensibility of the sensorial organs; restlessness; anxiety; watchfulness; slight aberrations of the mind; a feeling of heaviness, pressure, heat, and pain in the part; and in some instances, a turgid state of the veins, redness, and swelling in external parts remote from the organ from which the blood is about to flow.

Hæmorrhages are called *passive* when there is neither sanguineous congestion, nor a sense of heat and fulness, but a *de-*

creased instead of an *increased* vascular activity, both of the general system and of the part from which the hæmorrhage occurs—the exhalents suffering the blood to escape passively from want of vital activity to resist its entrance and transmission.

Some have contended that all hæmorrhages are necessarily active; that the blood is always thrown out by an *action* of the exhalents, and not merely forced through them, as through passive tubes by the *vis à tergo*. This may be true; and yet when we find some chronic hæmorrhages, connected with great feebleness and relaxation, speedily arrested by remedies which all physicians are accustomed to regard as the most energetic means we have for stimulating or exciting these very vessels to increased activity, we cannot be much out of the way if we call such discharges *passive*. In that variety of chronic hæmorrhage which occurs in relaxed and debilitated females at the critical period of life, we possess no medicine which so promptly and safely arrests the discharge, as small doses of aloes and savin in combination—the very remedies, too, which we often find most successful to excite the menstrual evacuation; in other words, the uterine vessels.

This variety of hæmorrhage depends either on mere relaxation and inactivity of the vessels, without any morbid changes in the constitution of the blood, in consequence of previous diseases, excessive discharges of all kinds, and other exhausting influences; or it is connected, and probably in a great degree dependent on a thin, watery, or dissolved state of the blood, and therefore incapable of communicating healthy impressions and activity to the general and capillary systems of vessels. This state is always attended with a variety of symptoms besides the hæmorrhage, indicative of a relaxed, exhausted, and sometimes irritable condition of the system.*

Of this kind of hæmorrhage (*passive*) are those which occur in some chronic affections, attended with great relaxation, exhaustion, and morbid irritability, such as scurvy; and in the stage of collapse of malignant and other typhous forms of febrile diseases.

In some instances, the hæmorrhage partakes of both the active and passive characters just mentioned. The vessels of some particular part may be habitually debilitated, inactive, and relaxed, and consequently especially predisposed to congestion. If in this state, some accidental circumstance supervenes, which increases the general momentum of the circulation, or particularly favours the determination of blood to the debilitated vessels, a hæmorrhage may occur, attended both with general vas-

* Jahn. Klinik der Chron. Krankheiten, Bd. iii. p. 272.

cular activity, and local torpor and relaxation. This occurs sometimes in *hæmorrhois.*

The effects of sanguineous discharges on the system, are of course various, according to the suddenness and quantity of the evacuation, their duration, and the constitutional habit of the patient. The immediate effects of a considerable loss of blood on the heart and arteries, need not be particularly enumerated. When the hæmorrhage is excessive, the respiration becomes quick and difficult, the skin pale and cool; tremors of the extremities, chills, ringing in the ears, dimness of sight, and finally syncope, ensue. When fainting occurs, the bleeding usually ceases. In violent cases, the syncope may terminate in immediate death; but such a termination is by no means common in spontaneous hæmorrhages. More or less reaction usually soon returns, and the bleeding either remains permanently arrested, or re-appears with diminished activity, continuing, in some instances, with occasional intermissions, until the whole system becomes greatly relaxed and exhausted.

The secondary effects of profuse or long-continued discharges of blood are often very alarming, obstinate, and even fatal. These remote consequences of hæmorrhage are indeed among the most important circumstances connected with sanguineous discharges, whether they be considered in a pathological or practical point of view, and deserve the greatest attention.

After the immediate exhaustion of a profuse or protracted hæmorrhage has in some degree gone off, the whole system is sometimes left in an extremely excitable state. The pulse becomes very frequent, throbbing, sharp, moderately full, and compressible; the least corporeal exertion or mental excitement produces agitation, strong beating of the carotids, palpitation of the heart, hurried respiration, and throbbing along the course of the abdominal aorta. In some instances of this kind, the arterial reaction becomes still more vehement. A pulsating, deep-seated pain in the head, and a high degree of morbid sensibility of the brain occur—manifested by great intolerance of light and sound, and occasionally more or less delirium, with other manifestations of cerebral irritation. This state of tumultuous reaction and general irritability sometimes gradually subsides, and health slowly returns. In individuals, however, of weak powers of constitutional resistance, this secondary excitement is apt to terminate in a state of great feebleness and exhaustion. The patient becomes sluggish both in mind and body; he is disposed to dose, and is inattentive to surrounding objects; the face acquires a peculiarly pale and slightly tumid appearance; the pulse is frequent, irregular, and though often large, feels as if the artery were filled with wind. The muscular powers are greatly prostrated; respiration is difficult, interrupted by deep sighs, and attended

with a peculiar *crepitus*, changing finally to a slight, rattling sound in the trachea and bronchia. In cases of this kind death sometimes supervenes, apparently from effusion into the lungs; in other cases cerebral oppression, coma, and insensibility, precede for several hours the fatal termination.*

In many instances, however, the morbid consequences of hæmorrhages are of a much more chronic character. When the blood-vessels are much drained by copious or protracted sanguineous discharges, absorption always goes on very actively.† They soon become replenished, therefore, with a crude and watery fluid; the blood is greatly attenuated—containing often but a few ounces of cruor in a pound of the fluid. In consequence of this state of the blood, the heart and arteries are irritated; all the animal and organic functions become enfeebled and sluggish; the face and inferior extremities become more or less œdematous; and the whole surface acquires a peculiarly pale, exsanguious, leucophlegmatic appearance; the mind is torpid; the countenance anxious, or vacant and apathetic; the heart palpitates strongly on the slightest exertion; the hands and feet are cold; the thirst usually very considerable; and the appetite variable, and attended with gastric pain or uneasiness, flatulency, sour eructations, and other dyspeptic symptoms. If the urinary secretion is small, general anasarca, or other forms of dropsy ensue; or colliquative hæmorrhage may return, and finally extinguish life.

Causes.—The degree of constitutional predisposition to hæmorrhagic discharges varies much in different individuals. Some persons appear to be particularly indisposed to spontaneous hæmorrhage; whilst others, on the contrary, are naturally very prone to discharges of this kind, although in other respects of vigorous and healthy constitutions. In some individuals, there exists so great a constitutional hæmorrhagic predisposition, that the slightest wound of the skin is apt to cause the most alarming discharges of blood, and which no applications are, in some instances, able to arrest. It appears, moreover, that this extraordinary tendency to hæmorrhage is sometimes hereditary. Fordyce relates the case of a man who bled almost daily from the nose. All his children were extremely subject to epistaxis, and one of them died of this affection. Several very remarkable instances of this kind are reported in the second number of the *American Medical Review.*

It appears also that the predisposition to the different varieties of hæmorrhage varies with the age of the individual. During childhood, hæmorrhages are most apt to occur from the nose;

* Dr. Marshall Hall. Medical Essays, p. 41.

† The experiments of Magendie and others have fully demonstrated this fact. Under the head of dropsy, I have entered more fully into the pathological circumstances which result from this principle.

between puberty and the thirtieth year of age, hæmoptysis would seem to be most common; in middle life, hæmorrhage from the rectum occurs most frequently; and in very old people, hæmaturia is not uncommon.*

With regard to the occasional or exciting causes of hæmorrhages, it may be observed, that whatever is capable of producing strong local determinations to soft and very vascular structures, particularly the mucous membranes, may give rise to effusions of blood. The following are the principal causes of this kind. High atmospheric temperature suddenly succeeding cool and damp weather; sudden diminution of atmospheric pressure—hence the aptitude to hæmoptysis and epistaxis on ascending high mountains. Various causes tending to obstruct the free return of the blood to the heart; such as ligatures, tumours pressing upon large venous trunks, tight cravats, visceral indurations, and tightly laced corsets; cold repelling the blood from the surface to the internal vessels. Causes that suddenly and greatly increase the momentum of the general circulation, as violent exercise, lifting heavy weights, stimulating ingesta, and violent mental excitement. Exertions that agitate, or over-exercise particular organs, as loud singing, long-continued speaking, vehement laughing, blowing wind instruments. Substances irritating particular organs, such as cantharides and turpentine acting on the kidneys, sternutatories, or acrid and stimulating inhalations irritating the respiratory organs. General plethora, and obstructions of habitual sanguineous evacuations, particularly amenorrhœa. Finally, gastro-intestinal irritation, giving rise to strong determinations to the chest or head.

Hæmorrhages of the *active* kind, frequently occur as *critical* evacuations, more especially in the synochal grades of fever. *Passive* sanguineous discharges are never critical, or more correctly speaking, perhaps never appear in connexion with a favourable change of the malady in which they occur.

In some instances, hæmorrhagic discharges occur periodically. Medicus has collected a number of examples of this kind in his work on periodical diseases.† Cases occur also, in which the hæmorrhage observes a strictly intermittent course—the bleeding returning daily about the same time, and continuing from a

* Cullen's First Lines, vol. ii. The explanation of these circumstances, as given by Cullen, though ingenious and plausible, is far from being satisfactory. It rests too much on the mere mechanical or hydraulic character of the blood-vessels. The intimate relation subsisting between the nervous and vascular systems, as vital structures, and the various sympathetic relations between the different organs themselves, subject to variations according to age, are probably much more concerned in the development of these and other predispositions, varying by age, than the circumstances mentioned by Cullen.

† Fr. Cas. Medicus. Geschichte Periodischer Krankheiten. Hanover, 1784.

few minutes to several hours.* I have met with a case of intermitting epistaxis which continued to recur daily for nearly a week. Recamier has related a case of epistaxis in which the bleeding returned every morning and evening for six days in succession.†

Prognosis.—The prognosis in hæmorrhages depends on the constitutional habit of the patient; the suddenness and copiousness of the discharge; the nature of the organ from which the bleeding occurs; its independence, or connexion with local or general disease; the character of the disease with which it may be associated; the period of febrile diseases at which it supervenes; and the character of the occasional causes. Hæmorrhage is not often fatal from the mere loss of blood. In the course of twenty-two years practice, I have met with but two instances of fatal termination from the direct and immediate effects of spontaneous hæmorrhage. Great diversity in relation to the power of sustaining sanguineous discharges occurs in different individuals. In some, immediate and alarming prostration is produced by comparatively small discharges of blood. Others will sustain exceedingly copious evacuations with but little immediate inconvenience, and speedily recover their usual vigour and health. The quantity of blood which may be lost without any dangerous or ill consequences, is indeed in some instances surprisingly great. Bertholini relates a case in which sixteen pounds of blood were discharged from the stomach without any serious consequences. In another instance, he says, the quantity of blood lost from the nose, in the course of three days, was still greater.‡ Nicholai also mentions extraordinary instances of this kind, (Pathologie, b. vi. p. 353;) Hæmorrhages, depending on chronic visceral disease, are in general more intractable than such as are free from disorder of this kind. When they occur during the stage of *excitement* of fevers, their effects are usually salutary, and should not be checked unless they become very copious and debilitating. The hæmorrhages which take place in the period of collapse, always portend the utmost degree of danger; they seem to depend on a general paralysis of the capillary system, indicative of incipient dissolution. Hæmorrhages which depend merely on the local congestion or irritation in an organ, without any constitutional disease, are seldom copious, and usually terminate spontaneously as soon as the local plethora is removed. It is different with those sanguineous discharges, where the local congestion and determination are sustained by some internal or constitutional irritation. In such cases the hæ-

* Reil, loc. cit. bd. iii. p. 38.
† Rev. Médicale, Feb. 1827.
‡ Anatom. Quintum Renov. 375. Reil, loc. cit. p. 27.

morrhage is particularly apt to continue long, to recur frequently, and to resist the permanent success of remediate applications. The prognosis depends also in some degree on the importance of the organ from which the hæmorrhage proceeds. A hæmorrhage from the lungs is, *cæteris paribus*, more to be dreaded than one from the stomach; and this latter is more dangerous than a bleeding from the nose.

With regard to the remote consequences of copious losses of blood, it may be observed, that individuals of a relaxed, nervous, phlegmatic, and irritable habit of body, are much more apt to suffer dangerous secondary disorders from such discharges, than persons of a contrary physical temperament.

Treatment.—The general indications to be kept in view in the treatment of hæmorrhages, are: 1. To lessen the momentum of the circulation, if it be above, or at its natural standard; 2. To diminish the determination of blood to, and moderate the local vascular action in, the part from which the hæmorrhage occurs; and 3. To excite a contraction of the vessels of the part. The first indication is to be fulfilled by venesection and the exhibition of sedatives—as nitre, digitalis, cold, &c. The second indication demands counter-irritating and revulsive applications —such as cold, applied, if practicable, to the part from which the blood flows; and blisters, sinapisms, warmth, and rubefacient frictions, on remote situations. The last indication requires the internal use of astringents—such as sugar of lead, alum, muriated tincture of iron, &c.; and where the situation of the part will admit of it, the external application of styptics.

Having made these general observations on hæmorrhages, I proceed to the consideration of the particular varieties, according to the part from which they proceed.

1. *Epistaxis.—Bleeding from the nose.*

This is by far the most common variety of hæmorrhage. As has already been observed, epistaxis occurs most frequently in early life, particularly about the age of puberty. The eruption of the blood is often preceded by symptoms indicative of a congested state of the vessels of the head—as a sense of weight and tension in the temples; violent beating pain in the head; throbbing of the carotids; flushed face; giddiness; ringing in the ears; and a sense of tickling, tension, or stinging pain in the nose. In weak and irritable persons, other symptoms, in addition to these, denoting a nervous and spasmodic condition of the system, are apt to occur—namely, slight creeping chills; disposition to syncope; cold extremities; a constricted state of the skin; and a small, corded, and quick pulse. In general, only a few ounces

of blood are discharged, and with this small loss of blood all the foregoing symptoms disappear. Sometimes, however, the blood flows so copiously and continuedly as to become alarming, and to demand active measures for its suppression.* The blood very rarely proceeds from both nostrils.

Causes.—The exciting causes of epistaxis are exceedingly various. Whatever has a tendency to produce a preternatural determination of blood to the head, may give rise to this variety of hæmorrhage; such as insolation, stimulating ingesta, protracted study, the warm bath, sneezing, coughing, playing on wind instruments, violent parturient efforts, straining in evacuating the bowels, a depending position of the head, violent affections of the mind, strong blushing, *intestinal irritation*, heavy lifting, &c. Chronic visceral disorders, particularly indurations of the *spleen* and liver, strongly predispose to epistaxis, and this hæmorrhage appears sometimes to be the consequence of organic affections of the heart and of the large vascular trunks. Suppression of the menstrual and hæmorrhoidal evacuations, may give rise to this hæmorrhage; and it very rarely fails to occur in that attenuated and watery state of the blood which usually follows copious, sanguineous, and other evacuations, in relaxed and leucophlegmatic habits. Bleeding from the nose is no uncommon occurrence in dropsical patients, and in the latter stage of cachectic diseases, particularly scurvy.

Prognosis.—Epistaxis is seldom of much consequence when it is not symptomatic of some serious visceral or general affection. When, however, it occurs readily and frequently in early life, it would seem to indicate a particular predisposition to hæmoptysis and phthisis pulmonalis; and frequent or habitual epistaxis, in middle and advanced age, may be regarded as a pretty sure indication of the existence of organic visceral disease, and of a strong tendency to dropsy or apoplexy, according to the general physical temperament and structure of the individual. Hæmorrhages from the nose, in inflammatory fevers, and in the stage of excitement of every form of fever, typhus as well as malignant, are to be regarded as salutary; but when they occur in the sinking stage, or period of collapse, they manifest a highly dangerous condition. This, as indeed all other varieties, of hæmorrhage, is most apt to become troublesome and dangerous in debilitated, relaxed, and irritable subjects; more especially, when the blood, at the same time, is thin and watery, or dissolved, as in scurvy. The most unmanageable hæmorrhages from the nose, are those which depend on some abdominal irritation or obstruc-

* Plouquet has collected a number of instances in which unusually large quantities of blood were discharged from the nose without fatal consequences — *Bibliotheca Medico Pract.* vol. iv. p. 69.

tion, in connexion with an attenuated state of the blood. Epistaxis is, however, very rarely fatal from the immediate effects of mere loss of blood, although, like other varieties of sanguineous discharges, it may lead to a train of distressing and dangerous chronic affections.

Treatment.—In being called to a case of epistaxis for remediate aid, the first and most important question is:—Are the circumstances preceding and accompanying the hæmorrhage; and is the hæmorrhage itself of such a character as to render it most proper to arrest it, or to suffer it to go on until it ceases spontaneously? When the hæmorrhage occurs in consequence of suppressed menstrual or hæmorrhoidal discharge, it ought not to be interfered with, unless it becomes excessive; and the same observation applies to the occurrence of this evacuation in the stage of excitement of febrile affections. In general, whenever epistaxis is attended with an active pulse, and symptoms of cephalic congestion, no attempt should be made to arrest the bleeding by local applications; but, on the contrary, nature should be assisted in the reduction of the vascular excitement by venesection, rest with the head in an elevated position, cold drinks, laxatives, and *nitre*. The last article, given in *large* doses, is often particularly beneficial, in cases of considerable arterial excitement. I have used it in every variety of active hæmorrhage with prompt and complete success, without any auxiliary application. This mode of proceeding is especially necessary in persons of robust and plethoric habits, and in such as are subject to hæmorrhoidal discharges. But when nasal hæmorrhage occurs in weak, nervous, and cachectic individuals, and particularly when the manifestations of general vascular turgescence and increased momentum of the circulation are absent, the sooner it is arrested the better.

In moderate cases, it will often be sufficient to apply cold water to the temples, head, and nape of the neck, while the head is kept in an elevated position. Richter asserts, that cold water applied to the genital organs, has a sudden and powerful effect in arresting bleeding from the nose. If the hæmorrhage should not yield to these simple measures, small doses of sugar of lead may be given internally. This is decidedly the best internal astringent in every variety of active hæmorrhage.* From one to two grains may be given every half hour until the bleeding is checked; and, in most cases, its effects are promptly successful. The *gallic acid*, also, is said to be a very powerful styptic for the cure of this and other varieties of internal hæmorrhage. Dr. A. T. Thomson, has lately published the result of his ana-

* Various other internal astringents have been recommended—as, the sulphate of zinc, alum, sulphate of copper, gum kino, and the muriated tincture of iron. They are, however, greatly inferior to the sugar of lead.

lysis of Ruspini's celebrated styptic, and from this it would appear, that its active principle is the *galic acid*—Ruspini's styptic is, according to Dr. Johnson's experience, "unquestionably the most powerful restrainer of hæmorrhage which we possess;" and as its price is "enormous," it is much to be hoped that Dr. Thomson's analysis may be correct. Be this as it may, experience has shown that the galic acid is a powerful agent for restraining internal hæmorrhages. In general, the hæmorrhage may soon be permanently arrested by these means; but where the hæmorrhagic disposition is strong, or in relaxed and debilitated habits, the bleeding, though checked for a time by applications of this kind, is apt to return again and again, until the system becomes greatly exhausted. In cases of this kind, we may generally succeed in putting a permanent stop to the discharge, by applying a blister to the back of the neck; and in order to obtain vesication speedily, the skin, where the blister is to be applied, should be previously well rubbed with the terebinthinate decoction of cantharides, oil of monarda punctata, or some other active rubefacient.

Warm pediluvium is always a useful auxiliary remedy, by determining the circulation to the inferior parts of the body; or, instead of this, sinapisms may be applied to the ankles or soles of the feet. Local styptics are recommended in obstinate cases, but they are very rarely of much avail, and may even do mischief by the irritation they cause in the snyderian membrane, and the consequent afflux of blood. Nevertheless, in obstinate and alarming cases, a dossil of lint, dipped in some astringent solution, should be introduced into the nostril, and passed up to the part from which the blood issues. In general, however, simple compression, by plugging up the nostril with lint, will answer all the purposes that can be obtained from applications of this kind. The patient must be cautioned against blowing his nose, as well as against every thing which may excite the arterial system. Upon the whole, bleeding, purgatives, and nitre, with cold water to the head, warm pediluvium, or sinapisms to the feet, blisters to the back of the neck, the internal use of sugar of lead, and finally, mechanical compression, are the remedies which must be relied on in this variety of hæmorrhage.

2. *Hæmatemesis.—Hæmorrhage from the stomach.*

The premonitory symptoms of hæmorrhage from the stomach, are, in general, conspicuous. They consist in a sense of weight and pressure in the epigastrium; loss of appetite, or voraciousness; foul breath; acid eructations; pain and tenderness in the

hypochondria; nausea; anxiety; ringing in the ears; disposition to syncope; a small, contracted, and irritated pulse; alternate flushes of heat and chills; palpitation; cold extremities; a pale and contracted countenance; and finally, extreme anxiety; and weakness and constriction about the breast; the senses become confused; great sickness of the stomach, with a feeling of approaching syncope; and at last, copious ejections of blood from the stomach, ensue. The blood thrown up is generally of a very dark colour, sometimes in coagulated clots, and at others quite fluid. Occasionally, however, it is florid and liquid. Instances are mentioned, in which small masses of concreted lymph, deprived of the cruor, resembling pseudo-membranous structures, were thrown up.* Sometimes, the blood ejected is of a black colour, resembling tar. In cases of this kind, the hæmorrhage probably proceeds from the liver. In malignant fevers, particularly in yellow fever, the discharge resembles coffee-grounds suspended in a glairy fluid. This would seem to be generally the case when the hæmorrhage arises from inflammation and abrasion of the mucous membrane of the stomach. In some instances, partial syncope follows the vomiting, and the patient complains of pain in the region of the spleen and in the lower part of the abdomen. The quantity of blood thrown up at once is often very great. Instances of *fatal* hæmorrhage in the stomach have occurred also, in which little or no blood was discharged, (Richter;) and in some cases the blood passes off by the bowels with little or no discharge by vomiting. After the blood which had gradually accumulated in the stomach is thrown off, the patient generally soon feels greatly relieved, though often much exhausted. Very frequently, however, the same train of symptoms already mentioned return, after a longer or shorter interval, and terminate in another spell of vomiting of blood; and the hæmatemesis may thus recur several times before it finally ceases.

The hæmorrhage no doubt generally occurs from the mucous membrane of the stomach, but it is thought also to proceed in some cases from the liver or spleen. When the blood comes from the former organ, it passes along the common bile duct into the duodenum, and thence regurgitates into the stomach. When the spleen is the source of the hæmorrhage, if this be ever the case, the blood, it is supposed, gains admission into the stomach through the *vassa brevia*. Richter observes that the frequent tumefaction of the spleen, a short time before the occurrence of hæmatemesis, as well as the morbid or unnatural condition of this organ in those who die of this disease, render this opinion very probable. It is more likely, however, that the spleen is

* Reil. Fieberlehre. B. iii. p. 134.

no further concerned in the production of this hæmorrhage than by the congestion which it is peculiarly calculated to produce in the vessels of the stomach when its own structure becomes engorged or indurated.

The darker and more coagulated the blood is when thrown up, the slower we may presume must have been the hæmorrhage, or the longer it must have lain in the stomach. A portion of the effused blood always gains admission into the bowels, and hence generally dark, grumous, alvine discharges, occur for several days after an attack of hæmatemesis.

Causes.—Every thing which tends to impede the free circulation of the blood in the abdominal viscera, may give rise to this variety of hæmorrhage. Among the circumstances which tend most particularly to this effect, are indurations of the liver and spleen. It occurs also in consequence of suppressed hæmorrhoidal discharge, more especially when favoured by an indulgence in the pleasures of the table, or by an inactive and sedentary mode of life. In no subjects, however, is vomiting of blood more apt to occur than in young females, soon after the age of puberty, labouring under menstrual irregularities. It appears also occasionally to arise from pregnancy, and from the final cessation of the menses at the critical period of life. Various local causes may produce hæmatemesis, such as acrid or corroding substances received into the stomach ; blows on the epigas trium ; and it takes place sometimes in the last stage of malig nant fevers. The blood may proceed from the nose, and gradually descend into the stomach. This occurs sometimes in patients confined to bed by other diseases. In such cases, however, the quantity of blood thrown up is always small, and the vomiting is not preceded by the spasmodic and painful affections of the stomach mentioned above.

Prognosis.—When hæmatemesis occurs in consequence of suppressed hæmorrhoidal or catamenial discharge, it is not in general attended with much immediate danger, unless the vomiting returns frequently, in which case it seldom fails to lead to a train of distressing and dangerous consequences, such as dropsy, inveterate dyspepsia, hysteria, hypochondriasis, and great languor, relaxation, and debility. It is most dangerous when it arises from visceral obstructions, particularly in persons who are addicted to the intemperate use of spirituous liquors. There is no varity of hæmorrhage more apt to become habitual than this one. Tissot relates a case which recurred regularly every month, instead of the menstrual evacuation, without any evil consequences whatever.

Treatment.—The momentum of the circulation must be diminished by venesection when it is above the natural standard. A large sinapism should be immediately applied to the epigas-

tric and hypochondriac regions, in order to derive the blood as much as possible from the vessels of the stomach. Dry cupping may also be beneficially used for this purpose; and warm pediluvium will assist materially in deriving the circulation from the congested abdominal viscera. Laxative enemata should be administered. In that variety of hæmatemesis which attacks females between puberty and the age of thirty, purgatives, according to the experience of Dr. Hamilton, are among our most valuable remediate means. There is generally in cases of this kind considerable menstrual irregularity, caused apparently by a loaded and torpid state of the intestinal canal. Free purgation, by exciting the portal circulation, and removing the intestinal irritation, will generally prevent the recurrence of the hæmorrhage in cases of this kind. I have in a few cases known decided benefit obtained from the use of active and repeated purgatives in this affection.

Dr. Sheridan has published some cases which go to show that emetics will sometimes do much good in this variety of hæmorrhage. He states that his father had used this remedy with great advantage in hæmatemesis, more than fifty years ago. I have not myself employed emetics in this affection; but I understand that Dr. Chapman has resorted to them with much benefit. Ipecacuanha would appear to be the proper emetic. Various astringents have been recommended in this affection. Saccharum saturni; galic acid; muriated tincture of iron; spirits of turpentine; alum-whey; muriate of soda; kino; cold water; and a variety of astringent vegetable infusions, have been employed and praised for their effects. The sugar of lead does not appear to be as efficient in this as in the other varieties of hæmorrhage, although without doubt the best astringent we possess in this affection. Indeed, internal astringents can afford but little advantage when the disease depends on obstructions of the liver or spleen, or upon some other chronic impediment to the regular circulation of blood in the portal circle. I have nevertheless derived very great advantage from the use of the spirits of turpentine with castor oil, in purgative doses, in several cases of hæmatemesis. In cachectic and debilitated subjects, more especially in chlorotic females, the muriated tincture of iron sometimes affords peculiar advantages. Burserius recommends the use of copious draughts of cold water in this affection. The expressed juice of the common nettle, (*urtica dioica*,) has been much extolled for its effects in this hæmorrhage, and I have known it used with apparent benefit.

The diet should be of the lightest and most unirritating kind, and the drink bland, cool, and acidulated. After an attack of this disease, the diluted sulphuric acid will generally be useful

in restoring the tone of the stomach, and checking the tendency to sanguineous effusion.

3. *Hæmaturia.—Hæmorrhage from the urinary organs.*

It is often difficult to say whether the hæmorrhage in bloody urine comes from the bladder, the ureters, or the kidneys. As it is of some importance in a practical point of view, to form a correct opinion concerning the source of the bleeding, it will be proper to point out the diagnostic circumstances particularly.

When the blood passes off unmixed with urine, or without an effort to evacuate this secretion, the hæmorrhage, it may be inferred, proceeds from some part of the urethra, (*stimatosis.*) When the discharge of bloody urine is attended with a stinging or dull pain about the neck of the bladder, and a sense of fulness and uneasiness in the perinæum, accompanied with frequent painful erections, and burning pain in the glans penis and anus, and the blood comes off in small flocculi, intermixed with pretty large coagula floating in the urine, there is good reason to infer that the hæmorrhage proceeds from the bladder. The coagulæ sometimes block up the neck of the bladder or urethra so completely as to cause complete suppression of the urine, and render the introduction of the catheter necessary to procure its evacuation.

In hæmorrhage from the kidneys or ureters, the blood is always very intimately mixed with the urine, so as to give to the discharge a uniform bloody appearance, without flakes, or small coagulæ. After the urine has stood some time, the blood subsides to the bottom of the vessel, into a uniform paste-like substance, leaving the supernatent urine clear. In hæmorrhage from the kidneys, the patient in general experiences little or no unpleasant sensations in the bladder; but in the region of the kidneys more or less pain and uneasiness is always felt, and there is usually a retraction of the testicle on one side, with a feeling of numbness of the thigh.

Hæmaturia sometimes occurs periodically. This is most apt to be the case when the hæmorrhage proceeds from the neck of the bladder, and is attended with an irregular or ineffectual hæmorrhoidal effort in the system. I am now attending a gentleman who has been regularly affected with bleeding from the bladder every two months for the last four years. He was formerly much troubled with hæmorrhois, but since the present complaint began, he has had no hæmorrhage from the rectum.

This variety of hæmorrhage is most apt to occur in old people —more especially in such as have been much affected with hæmorrhois, or in such as are of a gouty habit. Richter says that plethoric and corpulent women are peculiarly liable to hæmaturia

about the period of the final cessation of the catamenia. It is not uncommon to meet with this affection in very young children during dentition.

Causes.—Hæmaturia is often excited by calculous concretions in the kidneys and bladder, and by acrid or stimulating diuretics, as cantharides, spirit of turpentine, garlic, and other similar substances. It arises also from organic affections of the urinary organs. Scirrhus, ulcerations, and vascular or fleshy tumours in the bladder, ureters, and kidneys, may produce it. In some instances, the hæmorrhage occurs from a varicose state of the mucous membrane of the bladder; and it would seem that a highly congested condition of this membrane from chronic inflammation, is sometimes the cause of this affection. When the predisposition to the disease is strong, it may be readily excited by whatever is capable of increasing the general momentum of the circulation, and particularly by mechanical agitation of the urinary organs. There is a gentleman in this city who has been affected with bloody discharges from the bladder, at short intervals, for more than six years. It is frequently brought on immediately by active exercise, and especially by riding in a carriage over a rough pavement. It is not connected with calculus, nor with pain, though often accompanied with a sense of weight, pressure, and uneasiness, about the neck of the bladder. One of the most frequent causes of hæmaturia in advanced age is an ineffectual hæmorrhoidal effort, or suppression of this discharge after it has become habitual.

Hæmorrhage from the urethra frequently occurs in gonorrhœa, in consequence of irritating injections.

This variety of hæmorrhage is seldom attended with alarming effects from the mere loss of blood. When it occurs in the latter stage of violent grades of fever, it is indeed one of the most fatal signs. Frequent and copious hæmorrhagic discharges from the bladder in old people is particularly apt to lead to dropsical effusions. (Richter.) When, however, it occurs vicariously in the place of hæmorrhois or menstruation, it is rarely followed by serious consequences; nor is this hæmorrhage attended with danger when it arises from irritating diuretics, from dentition, or from overheating, unless it be connected with considerable inflammation.

Persons who have once been affected with this complaint, are in general particularly liable to a return of it from the action of any of its exciting causes.

Treatment.—In plethoric and young subjects, an attack of hæmaturia, like any other hæmorrhage in such a habit, requires a prompt reduction of the momentum of the circulation by venesection. When the hæmorrhage depends on calculous irritation in the kidneys, the warm bath, assisted by opium and sugar of

lead, are generally decidedly beneficial. A quarter of a grain of opium with a grain of sugar of lead, may be given every hour, until the pain and irritation are allayed. Free venesection should, however, be premised in such cases; and much advantage may also be obtained from cupping and sinapisms over the region of the affected kidney. Along with these measures, copious draughts of mucilaginous diluents should be taken, more especially when the renal irritation arises from acrid diuretics, or other substances taken internally. The uva ursi has been much recommended for the cure of this affection; but although I have tried it repeatedly, I have never yet derived any obvious benefit from it. Dr. A. T. Thomson says, that "the addition of some galic acid to a tincture of uva ursi, will be found to answer every indication that can be expected from the employment of astringents in hæmaturia.* When the hæmorrhage is not attended with symptoms of renal irritation, or pain in the region of the bladder, the muriated tincture of iron, with the free use of mucilaginous drinks, will often do much good. I have in several instances found this astringent decidedly beneficial, after the sugar of lead had failed to procure any advantages. From twelve to twenty drops of this tincture may be given, three, four, or five times daily, according to the urgency of the symptoms. In all instances the diet should be light, unirritating, and digestible, and all kinds of stimulating beverages, and active diuretics, most carefully avoided.† In one case of long standing, I succeeded in putting a permanent termination to the hæmorrhage by small doses of alum and ipecacuanha,‡ in conjunction with a milk diet, mucilaginous drinks, and the occasional use of a mild aperient. Reil recommends cold and bland injections into the bladder when the blood proceeds from this viscus. He mentions also strong coffee, with laudanum, taken occasionally, as useful when this affection is attended with difficulty and pain in voiding the urine. In habitual hæmaturia, a caustic issue on the upper and inner part of the thigh, or near the groin on the abdomen, is said to have proved very beneficial. (Richter.) In recent cases of an obstinate character, we may sometimes make a successful impression on the disease by sinapisms applied over the sacrum. I have known this application to arrest a copious hæmorrhage from the bladder, after various other measures had been adopted without avail. Various astringent vegetable infu-

* Ed. Med. & Phys. Jour. Jan. 1831.

† Burserius relates an instance of obstinate hæmaturia, which was cured by a long course of milk diet, without any other remedies.—*Institutionum. Med. Pract.* vol. iv. p. 487.

‡ ℞. Pulv. aluminis ʒi.
——— ipecac. gr. xx.
M. Divide into ten equal parts. S. Take one every morning, noon, and evening.

sions have been employed and recommended in this variety of hæmorrhage, but they seem to be of little value. In chronic and moderate cases, we may employ a decoction of logwood with occasional benefit. Where the blood proceeds from the urethra, cold water or ice should be kept applied to the genitals. This will seldom fail to put a stop to the bleeding. We may also inject cold solutions of the sugar of lead in cases of this kind. The patient should not be permitted to use any exercise in recent cases. Perfect rest is often essential, particularly when the hæmorrhage is attended with manifest local and general irritation.

4. *Hæmoptysis.—Hæmorrhage from the lungs.*

This term is applied to hæmorrhages from the respiratory passages, whether they proceed from the larynx, the trachea, or the bronchia. In its concomitant phenomena, degrees of violence, and duration, hæmoptysis varies very much. In many instances the quantity of blood brought up is very small; in some cases it is discharged in considerable, but not exhausting quantities; and occasionally the bleeding is sudden and exceedingly copious.

Active hæmorrhage from the lungs is often preceded by certain premonitory symptoms; such as a feeling of heaviness and lassitude in the extremities; anxiety; stricture across the breast; short cough; palpitation of the heart; deep and frequent sighing; a deep-seated, pungent, or burning pain under the sternum, and slight creeping chills; cold hands and feet; alternate paleness and flushing of the face; mental and corporeal irritability; a quick, small, frequent, and corded pulse; and often a disagreeable salty or sweetish taste in the mouth. After these symptoms have continued for a longer or shorter period, the patient usually begins to feel a sense of warmth in the breast, gradually rising up towards the larynx, attended with a saltish taste. Slight coughing now ensues, or an effort is made to hawk, and the blood makes its appearance. In many cases, however, the hæmorrhage comes on suddenly, without any premonitory symptoms whatever. When this is the case, there is commonly but little blood discharged at a time; but the hæmorrhage is apt to return frequently for several weeks, and even months.

The blood is usually very florid and frothy, particularly when it proceeds from the trachea and larger bronchia. In malignant fevers, scurvy, gangrene of the lungs, and in the pneumonia of old people, the blood, however, is dark, and sometimes almost black, and generally dissolved.

When the hæmorrhage proceeds from the fauces, the blood is generally spit out without coughing; and when it comes from

the cavity of the mouth, there is usually neither coughing nor hawking in throwing out the blood. In some instances, however, when the bleeding is profuse, the blood descends and irritates the glottis, giving rise to a mixed effort of coughing and vomiting, which may readily lead to the supposition that the blood proceeds from the lungs.

Portal mentions a singular instance, which was treated unsuccessfully for hæmorrhage from the lungs. The quantity of blood coughed up was very copious, and although frequently checked, recurred again and again until the patient sunk under it. On dissection, the bronchial glands were found much tumefied —some of them as large as a hazel-nut, and charged with a large quantity of black fluid. The lungs were sound, but the bronchial cells were filled with a dark grumous fluid.

In most instances, those who have once suffered an attack of spitting of blood, are subject to returns of it at irregular periods; and in some rare instances this affection has been known to return periodically. Schrœder mentions a case in which a considerable portion of blood was coughed up every morning for many days in succession, not the least hæmorrhage having occurred during the rest of the day; and Alexander Thompson relates an instance, in which hæmorrhage from the lungs came on every third day with perfect regularity for upwards of a year. Reil also saw a case of quotidian hæmoptysis in a female, which continued for two years. The bleeding always occurred in the morning. Cases in which hæmorrhage from the lungs returned monthly, are mentioned by Amatus Lusitanus, Schenk, Meyer, and Mead; and Richter mentions an instance in which it occurred every four weeks instead of the menstrual evacuation, for upwards of twenty-five years. (Spec. Therap.) Blanchard saw an instance of its recurrence for a long period (every three months) in consequence of suppressed hæmorrhoidal discharge.*

Predisposition.—The period of life most favourable to the occurrence of this variety of hæmorrhage, is between the fifteenth and thirtieth years of age. Some individuals are constitutionally predisposed to it; and, indeed, in the majority of cases, in which it occurs spontaneously, such a predisposition lies at the bottom of the disease. This predisposition would seem to consist in an irritable state of the circulatory system generally; and in a delicate organization of the pulmonary system. The habit of body—so far as its physical conformation may be concerned —which seems most generally connected with a particular predisposition to this hæmorrhage, consists in a narrow, flattened, and depressed chest; high, prominent, square shoulders; a long and slender neck; a general slender, and delicate frame of body;

* Medicus. Geschichte Periodischer Krankheeten. Th. i. p. 115.

fair hair, and blue eyes; a delicate and fair skin, through which the superficial veins are conspicuous; red cheeks; sound white teeth; and a clear, but not powerful voice. Such individuals are of a sanguineous temperament; irritable, passionate, full of activity, but incapable of enduring much exertion; they are apt to be troubled with irregular determinations of blood, particularly to the head; and slight exciting causes create palpitation of the heart and general arterial excitement. During early youth, persons of this temperament and habit, are apt to be affected with glandular swellings about the neck; eruptions on the scalp and behind the ears; and as they advance in age, with slight catarrhal affections, which frequently go off slowly with a copious expectoration. In such individuals, after they have passed the age of puberty, the ordinary exciting causes of hæmorrhages are particularly apt to give rise to spitting of blood.

Causes.—The exciting causes of hæmoptysis are, of course, extremely various. The following are among the most common and powerful. Atmospheric vicissitudes; violent bodily exertions; the intemperate use of stimulating drinks; the suppression of habitual evacuations; the sudden drying up of old ulcers; repercussion of cutaneous eruptions; suppressed habitual sweating of the feet; metastasis of gout; rheumatism; irritating substances acting directly on the mucous membrane of the lungs, as the inhalation of fine irritating particles floating in the air, or of gaseous substances; intestinal irritation; organic diseases of the heart; obstruction of the spleen or liver; a sudden diminution of atmospheric pressure; breathing a very heated air; blows on the chest; costiveness; loud speaking, or singing; violent mental excitement; and organic affections of the lungs, impeding the free circulation of the blood through its vessels, particularly tubercles. Hæmoptysis sometimes follows the amputation of a limb, or the taking up of a large artery.

Prognosis.—Hæmoptysis seldom proves fatal from the mere loss of blood. It is, nevertheless, generally of very serious import—being, in many instances, the forerunner or attendant of phthisis pulmonalis. It is not, however, always followed by consumption, or even connected with a phthisical habit. Instances of pulmonary hæmorrhage not unfrequently occur without any dangerous consequences whatever; and this is more apt to be the case when the discharge comes on suddenly and profusely, than where there is an expectoration merely streaked with blood. The prognosis as to the remote consequences, depends, however, much on the pressure or absence of the general manifestations of a scrofulous or phthisical habit mentioned above. Where these indications are unequivocal, the occurrence of hæmorrhage from the respiratory passages, is always to be regarded as highly dangerous. When this hæmorrhage occurs from

pregnancy or suppressed catamenial or hæmorrhoidal discharge, there is usually no reason to apprehend any very serious consequences, if a predisposition to consumption does not exist. In general, hæmoptysis, resulting from causes which suddenly produce strong pulmonary congestion, or general arterial excitement—such as lifting heavy weights, or other violent bodily exertions; loud singing or declaiming; playing on wind instruments; over-distention of the stomach; stimulating drinks, &c. is much less apt to lead to dangerous consequences than cases that occur spontaneously.

Treatment.—The remediate management of hæmoptysis divides itself into that which is proper during the actual existence of the hæmorrhage, and that which should be pursued after the bleeding is arrested.

When the pulse is frequent, tense, or hard, the momentum of the circulation should be immediately reduced by venesection; and to effect this purpose adequately, it is often necessary to abstract blood very copiously. In some instances, the pulse will be found very small, but tense and firm to the touch; and in such cases it is particularly important to resort to prompt and very free venesection. At the same time that this step is taken, large portions of *common salt*,* or small doses of sugar of lead, should be administered at short intervals, until the hæmorrhage is checked. A large sinapism may also be applied over the breast, as soon as the activity of the pulse is reduced. Perfect rest and cooling drinks should be rigidly enjoined. If the feet are cold, warm applications or sinapisms ought to be applied to them; and the patient may take an occasional draught of *cold water*.† If the bowels are constipated, the rectum should be emptied by laxative enemata. In cases of this kind, large doses of the *nitrate of potash* will often promptly arrest the hæmorrhage; and in a manifestly phlogistic state of the system, it is decidedly the best internal remedy we possess in this affection. This article was long ago strongly recommended by Selle;‡ and Richter speaks very favourably of its powers in this disease. Dickson also gave it in very large portions, dissolved in mucilaginous fluid, in this

* This article was first introduced to the notice of the profession, as a prompt and efficient remedy in hæmoptysis, by Dr. Rush. It would seem, however, from Schopf's account of his Travels in the United States, (Bd. i. p. 116,) that the knowledge of its powers in this way was first brought to this country from Ireland, by Schiel.

F. Hoffman and Fordyce assert, that a solution of *sulphate of soda* will often do more good in hæmoptysis than any other remedy.

† Burserius (Inst. Med. Pract., vol. iv. p. 33,) says much in favour of the use of frequent draughts of cold water, (the temperature of which is to be lessened from time to time, until it is at last taken as cold as ice,) in this variety of hæmorrhage.

‡ Medicina Clinica. Berlin, 1797. p. 147.

affection, with much benefit;* and we may likewise cite the experience of Gibbon,† and Hartmann,‡ in favour of its excellent effects. In Italy it has of late years been greatly extolled as a remedy in hæmoptysis, and, according to my own experience, not more than it deserves. Recamier has within a few years reported some cases illustrative of its beneficial effects in this variety of hæmorrhage. He gave half an ounce of nitre, dissolved in a mucilaginous mixture, in the course of twenty-four hours, and in this way three cases were promptly relieved after bleeding and other remedies had been used ineffectually.§ From fifteen to twenty grains of this article, dissolved in a small cup of barley-water or some other mucilaginous fluid, may be taken every half hour or hour, until the bleeding is checked. A great variety of internal astringent remedies have been recommended in this affection—such as alum, colcothar of vitriol, sulphate of copper, sulphuric acid, &c.; but they are all much inferior, in efficacy, to the sugar of lead. This article may be given in doses of from one to five grains every half hour, or at longer intervals, according to the rapidity of the hæmorrhage. It appears to be equally applicable in cases attended with an active or debilitated state of the circulation. I have generally given it in union with calomel, where the diathesis was phlogistic; but in cases attended with a nervous or spasmodic condition, opium is the best adjuvant.

In cases attended with an irritated, small, frequent pulse, with a pale and contracted countenance, cold extremities, and a dry skin, small doses of sugar of lead, in combination with opium and calomel,‖ will generally procure prompt relief. Richter and Meza¶ recommend ipecacuanha in such cases. The former writer states that he has often promptly arrested hæmoptysis, attended with cold extremities, alternate flushing and paleness of the face, limpid urine, small and hard pulse, and much anxiety in the chest, by exhibiting a quarter of a grain of ipecacuanha every fifteen minutes. (*Specielle Therapie.*) It is in instances of this kind, that *emetics* may be given with advantage. Whenever a congestive state of the pulmonary system is present in this affection, with deficient action of the cutaneous

* Lond. Med. Obser. vol. vi. No. XVI.

† Medical Cases and Remarks. Lond. 1800.

‡ Nova Act. R. Soc. Scient. Upsal. vol. i. p. 109, as quoted in Richter's Ausfuhrliche Arzneimittellehre, vol. iv. p. 242.

§ Med. Chir. Rev. January, 1826.

‖ ℞ Calomel gr. vi.
Pulv. acetat. plumbi. gr. xii.
—— opii gr. iii.

M. Divide into 12 equal parts. Give one every thirty minutes if the hæmorrhage is considerable, or every two hours in less rapid cases.

¶ Reil. Fieberlehre. Bd. iii. p. 107.

capillaries, vomits will be likely to prove serviceable. They were formerly much, and too indiscriminately, recommended, by some practitioners. (*Brian Robinson.*) In ordinary cases, attended with a plethoric and excited state of the system, they are unquestionably hazardous. In the spasmodic and nervous cases just mentioned, Harles,* Stork, Richter, Plater, and others, speak very favourably of *hyosciamus.* Harles particularly recommends an oil prepared by boiling the leaves of this plant in flaxseed oil; and F. Hoffman considers the extract, given in doses of from one to three grains every hour, as one of our best remedies in such cases. According to Dr. Miner's experience, the powdered capsicum, given in doses of from three to five grains every ten minutes, is a most efficient remedy in hæmoptysis. I have had occasion to prescribe this article in one instance lately, and the result has given me a very favourable impression of its powers in this respect.

When spitting of blood assumes a chronic character, and is attended with an irritated state of the pulse, digitalis sometimes does much good. From one-fourth to half a grain of the powdered leaves, or from fifteen to twenty drops of the tincture, may be taken every four hours, until a manifest impression is made on the pulse. It will be proper to keep the system moderately under its influence for ten or twelve days. In cases of this kind, much advantage will, in general, result from blistering the breast—or, what is still better, *pustulating* this part with tartar emetic ointment, or establishing a more permanent discharge by a caustic issue or seton.

The nature of the occasional cause should be particularly kept in view in regulating the treatment of hæmorrhage, and especially for the prevention of its recurrence.

When hæmoptysis supervenes in consequence of suppressed hæmorrhoidal discharge, advantage may be obtained from the use of small doses of aloes, and particularly from the application of leeches to the anus. These measures are particularly useful in conjunction with a light diet, moderate exercise, and an occasional general bleeding, to obviate the return of the hæmorrhage from the lungs.

When the disease appears to arise from general plethora, in consequence of a free indulgence in the pleasures of the table, and an indolent course of life, or sedentary habit, it will be necessary to enjoin a simple, unirritating, and moderate diet, cooling drinks, moderate exercise, and the avoidance of all kinds of stimulating beverages.

Should the hæmoptysis be dependent on irregular, gouty irritation, or rheumatism, especial advantage may be gained from

* Hufeland's Journal der Pract. Heilkund. B. ix. s. ii. p. 47.

setons or issues on the inferior extremities, and a course of treatment calculated to counteract these affections.

When abdominal indurations exist, or intestinal irritation from a loaded state of the bowels, or acrid secretions, a gentle course of mercurial and aperient remedies, the extract of taraxacum, and other deobstruents, with a regulated diet and exercise, will be most likely to ensure exemption from a subsequent attack of the hæmorrhage.

If the bleeding appears to be excited by a violent cough, attended with irritation of the respiratory passages, expectorants, demulcents, leeching and cupping on the chest, venesection, and opiates, are particularly indicated. In such cases frequent doses of flaxseed oil are said to be very beneficial.* When the cough is violent and spasmodic, and the pulse contracted and small, with a dry skin, small doses of camphor and ipecacuanha, with mucilaginous drinks, often procure great and speedy relief. (Richter, Specielle Therapie, Bd. iii. p. 297.)

When hæmoptysis occurs in young females from menstrual irregularities, we may resort to the tincture of cantharides, venesection, blisters to the sacrum, riding on horseback, and the warm hip-bath ; but the ordinary stimulating emmenagogues must be carefully avoided. When cases of this kind are attended with a chlorotic, or sluggish and relaxed state of the system, the ferruginous preparations, the tincture of cinnamon, exercise by gestation, a nourishing and digestible diet, with aloetic aperients, &c. may be properly used. I have employed the following pills with obvious benefit in two instances of this kind.†

5. *Menorrhagia.—Hæmorrhage from the uterus.*

Uterine hæmorrhage appears under a great variety of modifications, both in relation to its phenomena and causes. Under the present head, however, I shall treat only of those hæmorrhagic discharges which occur in the unimpregnated state of the uterus—excluding also such as depend on organic or structural disease of the womb.

In some instances, the menstrual secretion becomes so copious as to cause much debility and exhaustion, and to require remediate interference. In many females, the flow of menses is always very large, who nevertheless enjoy a state of vigorous health.

* Journal de Med. tom. xxx. p. 85.

† R. Prussiat. ferri. ʒi.
G. aloes soc. gr. viii.
Tart. antimon. gr. ii.
Conserv. rosar. q. s.
M. Divide into thirty pills. S. Take two every morning, noon, and evening.

In instances of this kind, the discharge must not be regarded as morbid, or immoderate, however copious it may be; for if the system sustains no inconvenience from it, it is to be viewed as natural, or consistent with the constitutional habit of the individual in whom it occurs. So long, therefore, as the health of the female continues unmolested by copious menstruation, it cannot be accounted immoderate, or a proper object of medical attention; but when this evacuation gives rise to debility, exhaustion, and other symptoms of ill health, it amounts to a morbid discharge, and requires remediate measures.

Immoderate flow of the menses must not be confounded with *menorrhagia*. This latter is, strictly speaking, a *hæmorrhage*, whilst the former consists in a mere superabundant *secretion* of the natural or healthy menstrual evacuation. In menorrhagia the effused blood retains its power of coagulation, or at least shows a tendency to coagulate; but in immoderate menstrual discharge it remains liquid and entirely free from coagula.

Menorrhagia is sometimes preceded by various premonitory symptoms; such as pain and tension in the loins and pubic region; a feeling of fulness and pressing down in the uterus; frequent desire to pass urine; a small, contracted, and frequent —or a full, wave-like, or rebounding pulse; heaviness of the head; ringing and noise in the ears; slight creeping chills, transient flushes, and sense of weight in the feet. In many instances, however, the hæmorrhage commences without any indications of its approach. Sometimes a sudden gush of blood takes place, which continues to flow very copiously for a few hours, and then ceases. More commonly, however, the discharge continues for four or five days, and in some instances several weeks, and goes off very gradually. When it occurs about the period of the final cessation of the menses, it is apt to become very protracted in its duration, more especially in females of plethoric and relaxed habits of body.

All the consequences, that have already been mentioned as apt to occur from the excessive loss of blood, are especially prone to supervene from uterine hæmorrhage. Women of a nervous temperament are liable to sudden amaurosis from excessive uterine hæmorrhage, and they are especially subject to a very peculiar nervous pain in the head over the region of the orbit of one side; and sometimes they become affected with a distressing jarring noise "like that of a mill or threshing floor." (Hall). When menorrhagia is copious, and prolonged in its course, or recurs frequently at short intervals, it seldom fails to produce great relaxation and debility, and to lead ultimately to a train of very distressing, and even dangerous affections. Females who are much affected with this hæmorrhage, become pale, sallow, weak, and dyspeptic; and in phlegmatic habits,

œdema of the feet, or general anasarcous effusion, pains in the stomach, with great muscular prostration, are apt to ensue. Leucorrhœa, often extremely copious, almost universally occurs during the intervals of the hæmorrhages, and contributes greatly to the general debility and relaxation.

Menorrhagia may with much propriety be divided into *active* and *passive*.* The former variety occurs in sanguineous, robust, florid, and healthy females, and is almost invariably preceded for a short time by the natural menstrual secretion. These cases rarely continue more than seven or eight days, and are often attended with considerable pain in the lower part of the abdomen, with a frequent and tense pulse, and a dry and feverish state of the skin. *Passive* menorrhagia is almost entirely confined to the period when the uterus is about losing its functions —and is met with only in such as have been much debilitated and relaxed by privations or previous diseases, particularly protracted and profuse leucorrhœa; or in individuals of a nervous or phlegmatic temperament, who have been subject to profuse catamenial or menorrhagic discharges. The pulse, in cases of this kind, is small and weak; the muscular system relaxed and debilitated; the skin cool and pale; the countenance exsanguious, and expressive of anxiety and languor; the urine generally pale; and the stomach disturbed with frequent nausea, and other unpleasant sensations. The discharge is apt to continue for three or four weeks, and sometimes much longer. When in bed, the hæmorrhage is usually moderate; but on rising, or making the least bodily exertion, the flow of blood is often suddenly increased. If the hæmorrhage ceases, it is succeeded by a profuse leucorrhœal discharge, which is quite thin or watery.

Causes.—Females of vigorous and sanguineous habits are more subject to menorrhagia than the feeble. The predisposi-

* Dr. Dewees thinks there is good reason to doubt the propriety of this "mechanical distinction." He adopts the doctrine of Broussais, that all hæmorrhages are *active*, and quotes Dr. Caldwell in support of this opinion. Strictly speaking, there is, perhaps, no hæmorrhage absolutely *passive*, and in which the vessels that furnish the blood do not co-operate in the production of the hæmorrhage by some kind of action. In a practical point of view, however, this distinction is unquestionably both proper and useful. Would Dr. Dewees not consider *aloes* a very improper remedy in the menorrhagia of young, sanguineous, and robust females? He no doubt would. And why? Because experience has shown that this article is among our most efficient means for exciting the uterine vessels, and directing the afflux of blood to them. Yet this article, given in small, but frequent doses, deserves to be accounted the best remedy we possess for those protracted, exhausting, and obstinate uterine hæmorrhages which occur in relaxed, nervous, and phlegmatic habits, about the critical period of life. When, therefore, we see a particular modification of this discharge arrested by a remedy which we are accustomed to regard as decidedly calculated to stimulate the vessels from which it occurs—in other words, when we cure the hæmorrhage by exciting applications, we have good grounds for distinguishing it from those cases of the same affection which are invariably *increased* by its operation.

tion to this hæmorrhage is much favoured, by whatever has a tendency to produce general plethora, and by an irritable and relaxed state of the system. A luxurious and indolent life; the free use of high-seasoned and nourishing diet, wines, and cordials; tightly laced corsets; frequent and long indulgence in the warm bath; habitual costiveness, and inordinate sexual indulgence, are among the most common and influential predisposing causes of active menorrhagia. Copious and protracted leucorrhœa; mental depression; deficient and unwholesome nourishment; habitual exposure to a cold or humid atmosphere; in short, every thing which is capable of relaxing and debilitating the general as well as the uterine system, may favour the occurrence of passive menorrhagia.

Whatever tends to produce sanguineous congestion in the uterus may excite this hæmorrhage; such as riding on horseback; dancing; active purgating; the use of emmenagogues; immoderate venereal indulgence; long and rapid walking; a fall on the hips; stimulating diet and drinks; a loaded and constipated state of the bowels; suppressed hæmorrhoidal discharge; induration of the liver or spleen; and reading voluptuous novels, &c.

Treatment.—The indications in this, as in the other varieties of hæmorrhage are, to remove the predisposing and exciting causes if practicable; to lessen the momentum of the general circulation, if it be not below the natural standard; to derive the circulation from the uterine system; and finally, to constringe the bleeding vessels.

If the pulse be active, or tense and quick, venesection will be proper; and every thing which has a tendency to excite the action of the heart and arteries must be removed. The patient should lie on a mattress, avoid getting up or walking about, and take only the lightest kinds of liquid farinaceous nourishment and cooling acidulated drinks. Having diminished the momentum of the circulation, recourse must next be had to such remedies as experience has shown to be capable of constringing, or in some way or other checking the hæmorrhagic action of the bleeding vessels. Among these, the *sugar of lead* holds the first rank, and will seldom disappoint our expectations entirely, in the active variety of the disease. From two to three grains, either alone or with a grain of ipecacuanha, may be given every half hour or hour, or at longer intervals, according to the rapidity of the hæmorrhage. When the pulse is contracted and quick, it should be given in union with moderate doses of opium or Dover's powder. I have been in the habit of giving it in such cases with about a grain of camphor and the same quantity of ipecacuanha in each dose, with the view of exciting a gentle diaphoresis.

The tincture of cinnamon is, perhaps, more frequently used

by the German physicians in menorrhagia than any other remedy; and my own experience enables me to speak with much confidence of its usefulness in cases unattended with considerable arterial excitement. From thirty to sixty drops of it may be given every hour or two. I have, in some instances, known the discharge very promptly moderated by this medicine alone. A great variety of other astringent remedies are recommended in the books, for the treatment of this hæmorrhage. Alum, the extract of rathany, kino, the sulphate of copper, &c. may, no doubt, be used with occasional advantage; but they are not equal to the sugar of lead for arresting sudden and rapid menorrhagic discharges. In cases attended with a moderate and protracted flow of blood, the extract of rathany will often afford much advantage; and in instances of this kind, I have also used alum, in union with ipecacuanha, with marked benefit.* In cases accompanied with increased arterial excitement, the *nitrate of potash*, given in large doses, will often afford prompt relief. When the hæmorrhage is profuse and rapid, cold applications to the vulva and region of the pubis should be made. We may also resort to cold and astringent injections into the vagina. When the violence of the discharge has been in some degree checked, and it continues in a moderate degree, the *elixir of vitriol*, diluted in cold water, may be taken at short intervals with advantage. Should the measures already indicated fail to arrest or sufficiently to moderate the hæmorrhage, recourse must be had to the *tampon*. A strip of soft linen should be introduced by pushing it gradually into the vagina on the point of the finger, until the exit of the blood is obstructed. This will cause the formation of a coagulum, which, being immediately in contact with the bleeding surface, prevents the further progress of the effusion. *Emetics* also have been recommended for the suppression of uterine hæmorrhage; and in active cases of a protracted character, attended with symptoms of gastric disorder, an emetic dose of ipecacuanha will occasionally do much good.† Perfect rest, a light simple diet, and cooling drinks, must be enjoined, and all mental agitation carefully avoided.

In passive and protracted hæmorrhage from the womb, attended with the symptoms mentioned above as indicative of this variety of menorrhagia, little or no permanent advantage can be obtained from astringent and cooling remedies. These hæmorrhages are, indeed, often extremely obstinate in their course. From much attention to cases of this kind, I am satisfied that

* ℞. Pulv. sulph. aluminis. ℈i.
Pulv. ipecac. gr. xii.
M. Divide into six equal parts. Give one every three or four hours.

† Eberle's Mat. Med. vol. i. p. 27. Second edition.

the appropriate remedies are such as tend to invigorate the uterine vessels. Blisters to the sacrum will, in some instances, do much good; but the remedy which has most frequently succeeded in my hands, is a combination of aloes and the prussiat of iron,* in conjunction with the tincture of cinnamon. With these medicines I have often succeeded promptly in arresting such hæmorrhages. Dr. Dewees recommends small doses of *hiera picra*, a combination which I have known very effectual in several cases. Aloes is an old remedy in this variety of hæmorrhage. Burdach, in his Materia Medica, mentions its usefulness in such cases. Ergot may also be used with a prospect of advantage; and I have even resorted to the more active emmenagogues, such as the extract of *savin*, with evident benefit; and in no instance with disadvantage. The savin has indeed been highly recommended by several German writers, in uterine hæmorrhages of this kind. Dr. Feist asserts, that in menorrhagia of long continuance, attended with a sluggish and relaxed habit of body, and a pale and fetid discharge, prompt and complete relief may, in general, be obtained from the use of savin.† He recommends the following formula for administering this article.

℞. Pulv. folior sabin. ʒiii.
Extract. sabin. ʒii
Ol. Sabin. ℥i.
M. Divide into three grain pills. Take four three times daily.

Dr. Gunther, of Cologne, also, has published an account of some cases of profuse and long-continued menorrhagia which yielded to the extract of savin given in scruple doses.‡ The prussiat of iron, in doses of from ten to fifteen grains, has been employed by some practitioners with much success; and I do not doubt, from what I have seen of its powers, that it may be very beneficially given in this form of passive hæmorrhage. We may also resort to the muriated tincture of iron in cases of this kind. I have lately succeeded in putting a stop to a protracted hæmorrhage of this kind, by a mixture of the compound tincture of aloes and the muriated tincture of iron, according to the following prescription.

℞. Tinct. aloes compos.
—— ferri. muriat. āā ʒss.
M. Take twenty drops four times daily.

* ℞. Prussiat ferri ʒi.
G. aloes. gr. v.
Conserv. rosar. q. s.
M. Divide into 20 pills. S. Take one three times daily.

† Gemeinsame Deutsche Zeitschrift für geburtskunde.

‡ Rev. Med. Jan. 1827.

CHAPTER XIX.

PHLEGMASIÆ OF THE LYMPHATIC SYSTEM.

Phlegmasia Dolens.

This singular phlegmasial affection is almost exclusively confined to females in the *puerperal state;* and is characterized by a pale, tense, elastic, and extremely tender swelling of one of the inferior extremities; communicating to the touch a feeling of numerous indurated nodules and ridges under the skin; and attended with more or less fever, usually of a hectic character.

As has just been stated, phlegmasia dolens is almost exclusively a puerperal affection; and it appears from general observation, that the most common period of its attack varies between the fifth and ninth days after parturition. It is asserted by some writers (Good), that this disease "has never been known to affect any other part of the body than the lower extremities;" but Carus and some other authors mention instances of its occurrence in the superior extremities.

In general, the first manifestations of the disease are: pain and stiffness in the groin of one side, preceded or accompanied with chills, or strong rigours, followed speedily by the ordinary train of pyrexial symptoms. Occasionally, though rarely, the disease commences by pain and swelling in the foot, an instance of which I saw about fifteen years ago. Wherever the starting point of the disease may be, the swelling more or less rapidly extends itself over the whole limb, and continues to increase until the extremity becomes enormously distended and exquisitely painful to the touch. To the sight the swelling exhibits an even and uniform surface; but when the hand is lightly passed over it, a number of hard ridges and little indurations are felt, apparently immediately under the skin. The skin presents a pale or white, smooth, and glabrous appearance, and is preternaturally warm to the touch. In general, the swelling extends to the labium pudendi of the affected side, leaving the opposite labium and contiguous parts entirely free from tumefaction and pain. More or less tenderness is generally felt in the iliac region of the affected side, and the track of the round ligament is especially apt to become painful or tender. Mr. Trye, indeed, considers the tenderness in the course of the round ligament as a pathognomonic symptom. Position produces no change in the swelling, as is the case in œdema. When the disease is at its height, the skin of the affected limb is much whiter than that

of the sound side; and its temperature is always very considerably augmented. The disease is always attended, from its commencement, with considerable irritative fever, and the patient is generally extremely restless, and tormented by her sufferings.

The duration of the disease is very variable. It seldom, however, terminates under two weeks; and it may be prolonged to the fifth week, and even to a longer period. When it is about declining, slight sweats break out over the whole surface of the body, and the urine deposits a reddish sediment, whilst the fever progressively abates. The declension of the swelling is always very gradual, and the leg very rarely returns to the size of the sound one. Some degree of stiffness of the muscles of the leg usually remains after the total subsidence of the disease; and the skin continues for many months to be less moveable on the subjacent parts than in the sound state.

In some instances, though very rarely, the inflammation terminates in suppuration; and when this happens, the cellular membrane sloughs out from between the skin and muscles, as in the suppuration of erysipelas. The occurrence of this accident is always attended with the utmost danger. The only two fatal cases I have ever seen, terminated in this way—a termination which, in both instances, was caused by the ruinous treatment of an empiric, under whose mismanagement the cases were placed.

In general the breasts become flaccid, and the secretion of milk is in part, or even wholly, suspended. It is singular that this fact should be denied by Dr. Good; for I can affirm, that I have never met with an instance of this malady, in which the lacteous secretion was not conspicuously diminished. Dr. Huston of this city, in a well written and interesting paper on this disease,* declares that "in all the cases he has seen, the secretion of milk was diminished, and in some wholly suspended during the violence of the disease;" and the same observation is made by nearly every writer on this subject I have consulted.

In relation to the etiology and nature of this affection, writers have expressed a great variety of opinions. By many the disease has been ascribed to a metastastic transference of the lacteous secretion, from the breasts to the affected limb, giving rise to the deposition of milk into the cellular tissue of the extremity. This opinion was advocated by Puzos, Levret, Astruc, Doublet, Mauriceau, and by nearly all the German writers on this subject, until a very recent date. Others have ascribed the disease to an obstruction of the lymphatics at the brim of the pelvis, by the pressure of the child's head during parturition, giving rise to over-distention and consequent *rupture* of the

* North American Medical and Surgical Journal, vols. iv. and v.

lymphatics, whence effusion and accumulation of lymph in the glands and cellular tissue of the limb ensue. This doctrine was advanced by Mr. White of Manchester; but its fallacy has been abundantly exposed by various writers. Denman and others maintain that phlegmasia dolens consists essentially in *lymphatic inflammation*, commencing in one or more lymphatic glands in the groin, and thence extending along the lymphatic branches, until the whole limb becomes affected. The primary inflammation of the inguinal glands is excited, he thinks, by the acrid matter which is absorbed from the vagina. Dr. Hull conceived the disease to consist of inflammation of the muscles, cellular tissue, and inferior surface of the cutis, giving rise to a sudden effusion of serum and coagulable lymph into the cellular texture of the extremity; and according to Dr. Hosack, the inflammation occurs in *all* the structures of the limb—in the blood-vessels, absorbents, muscles, cellular membrane, skin, &c. In relation to this latter opinion, Dr. Huston very justly observes, that it is difficult "to conceive of an inflammation of all the blood-vessels of a limb, without the appearance of redness; or of such extensive inflammation as that involving every tissue of a part, without its termination in suppuration, gangrene, or other bad consequences, far more frequently than happens in phlegmasia dolens." More recently, Dr. Davies of London has published some observations tending to show that phlegmasia dolens is the result of an inflammation of one or more large veins, "terminating in the formation of artificial membranes and other obstructions within their cavities, whereby the free return of the blood from the extremity is prevented." This doctrine is also sanctioned by M. Velpeau; but the phenomena of phlebitis are certainly very different from those which characterize phlegmasia dolens; and there does not, on comparing these affections, appear to exist any reasonable grounds for this opinion. (Dewees, Huston.)

Whatever we may think of the mode of origin, or the location of the morbid condition which constitutes this affection, there can be no doubt that it is essentially an inflammatory affection; and there exists the highest degree of probability, that the whole system of lymphatic vessels of the limb is engorged and greatly distended with lymph, at the same time that some effusion may occur into the subcutaneous and intermuscular texture. The following sentiments, expressed by Dr. Huston, are entirely accordant with my own views on this subject, and as they embrace a clear summary of the arguments on this point, I cannot do better than to adopt his language.

"I believe it to consist in a complete '*engorgement*' of the whole lymphatic system of the affected limb; produced by an inflamed condition of the different conglobate glands, through

which the chief lymphatic vessels have to pass, on their way from the affected part, to the thoracic duct.

"This inflammation may occur either primarily in one or more glands, or first in a principal lymphatic trunk, and thence extend to the glands. And this may originate either, 1st, from the gland or lymphatic trunk being bruised by the passage of the child's head through the pelvis during labour: or 2d, from exposure to cold, and especially a damp or humid atmosphere; or the putting on of ill-dried clothes, during the irritable condition of the female system which attends the puerperal state: or 3d, from the absorption of some acrimonious matter, whereby the internal surface of the lymphatics themselves may be excited to inflammation, and thence extended to their appropriate glands; or the matter may be transmitted to the glands, and there excite inflammation. My reasons for the opinions which have been advanced, are briefly as follow:

"1st. The fact of every woman's exposure to one of the preceding exciting causes, and frequently to all of them.

"2d. The uniform occurrence of pain or uneasiness about the passage of the round ligament, in the groin, and down the inside of the thigh, *preceding* the existence of swelling or other affection of the limb whatsoever: showing conclusively the priority of disease in the glands and their communicating trunks.

"3d. The white colour of the affected limb; which can only be accounted for satisfactorily, by supposing an '*engorgement*' of the vessels which carry white fluids; for were it congestion of the blood-vessels, as in ordinary inflammation, there would necessarily be redness, instead of the white aspect.

"4th. The state of the woman's system generally, as the pulse, tongue, hectic form of fever, &c., all of which manifest a state or condition totally different from what is observed in cases of high and unequivocal inflammatory action; evidencing a state of *irritation*, or inflammatory action of a low or subacute character. This state of irritation may be readily accounted for, by the great distention of the lymphatic vessels of the limb, throughout their utmost ramifications, and the consequent pressure which must thence be made upon the immensity of nervous fibrils by which they are surrounded.

"Lastly. Its termination; which is far more uniform, and less fatal, than an equal extent of inflammation, attended with congestion of the blood-vessels seated in any part of the body; proving, incontestibly, that it must have a course peculiar to itself; which course, very commonly commencing by a diminution of pain in the iliac and inguinal regions, and next of the swelling of the parts nearest those glands, indicates very clearly the seat of the disease to be in the lymphatic system, and especially the conglobate glands."

This doctrine does not differ materially from the views given of the pathology of this affection by Trye, Capuron, Gardien, and Denman.

Treatment.—From what has been said concerning the general character of this disease, it is obvious that the treatment must be decidedly antiphlogistic. Blood-letting, both general and local, are required during the early stages of the complaint. The momentum of the circulation should be at once adequately diminished, by an efficient abstraction of blood with the lancet; after which it will be especially useful to apply leeches to the affected limb, particularly about the groin, and along the track of the principal trunks of the lymphatics. Dr. Dewees advises that the leeches should be dispersed over the limb, "that their bites may not be too near each other, as they sometimes leave troublesome sores." This precaution is very proper; as I have myself known very obstinate and extensive ulceration to proceed from a number of leech-bites near the groin, in a case of this kind. In some instances the febrile reaction, though not apparently very vehement, yields with great difficulty; and many venesections are required before the pulse can be sufficiently reduced. Dr. Dewees has found it necessary to bleed six or seven times before the disease yielded; and in a case which I treated about six years ago, five copious bleedings were required before an adequate impression was made on the pulse.

Purgatives should be freely used during the active stage of the disease. Dr. Dewees prefers the following mixture for this purpose.* In one instance I used the *magnesia* in union with the tincture of *colchicum*, with peculiar benefit. The patient was ordered to take a drachm of magnesia, with thirty drops of the tincture, every two hours. After the third dose, free purging ensued; and the result both in diminishing the general phlogistic habit, and mitigating the local symptoms, was much more conspicuous, than I had ever before witnessed from purgatives, or from any other remedy in this affection. I have not since had an opportunity of repeating this practice. In general, the purgatives should be of the saline kind.

Diaphoretics, more especially *antimony*, may be employed with considerable advantage in the early periods of the disease. *Tart. emetic*, given in as large doses as the stomach will bear, without causing vomiting, is highly recommended by some writers, and I do not doubt its utility, during the active stage of the complaint. The following mixture forms an excellent

* ℞. Sulph. magnes.
Magnesiæ alb. ust. āā ʒiii.—M. Div. in chart. iii. One of these to be taken every two hours, until they operate freely.

diaphoretic, where, after decisive blood-letting, there is much general irritation.*

Some writers have recommended emetics; but unless there are especial indications present for their employment, it does not appear that they are capable of procuring any material advantages.

In debilitated and irritable subjects, and *after proper depletory measures,* in the more robust and phlogistic, opium is often highly serviceable to allay the excessive pain and general irritation which usually attend this affection. This narcotic may be very properly given in union with nitre and ipecacuanha; or, what is still better, in the form of Dover's powders, in combination with nitre. It must be particularly observed, however, that opium is in general decidedly objectionable so long as the general and local inflammatory symptoms remain considerable; but in the decline of the disease, its effects are almost always highly soothing and beneficial.

Among the external local remedies employed in this affection, besides the leeching already mentioned, fomentations with flannel, wrung out of hot vinegar and water; the application of a strong solution of muriate of ammonia in equal parts of vinegar and water; and, after the pain, heat, and swelling begin to abate, moderately stimulating lotions—such as camphorated mixture diluted with an equal portion of brandy or whiskey, &c., may be accounted the most beneficial. Some writers strongly recommend the early application of blisters to the groin and to different parts of the extremity; whilst other writers, and amongst these Dr. Dewees, condemn this practice as rarely beneficial, and often decidedly injurious. My own experience does not enable me to say any thing in favour of blistering in this complaint, although I have never known any manifest harm to result from it. Where the pain in the extremity is very great, much relief may sometimes be obtained by bathing the limb with laudanum, more especially after proper evacuations have been procured. Emollient poultices have also been recommended for the purpose of allaying the pain, as well as assisting in the dispersion of the swelling; but in the early periods of the disease, this application appears to me calculated to do much mischief. The two cases already mentioned as having terminated in extensive suppuration, and ultimately in death, were treated from the commencement with *poultices;* but as all depletory measures were neglected, much of the mischief, no doubt, depended on the want of proper antiphlogistic means. After the

* ℞. Pulv. ipecac. compos. gr. xxiv.
Calomel. gr. iii.
Pulv. nitrat. potass. ʒi. M. Divide into eight equal parts. S. Take one every two hours.

fever, heat, and pain, have in a great degree subsided, emollient applications in the form of a poultice may contribute in some degree to the removal of the stiffness and tension of the affected limb; but this purpose is much more effectually answered by frictions with dry flannel; the application of a muslin roller, previously saturated with a strong solution of salt and dried, to the whole limb; and fumigations of the extremity with the fumes of burning rosin.

During the febrile stage of the disease, the diet must be of the simplest and weakest kind. During convalescence, the aliment should be digestible and nourishing, and when the patient is left in a very debilitated state, gentle tonics may be administered. If the weather is favourable, and the patient sufficiently recovered, exercise by gestation will be highly beneficial.

END OF VOLUME I.